Towards an Improved Framework of E-Government Implementation in Chaotic Environment; Proposed Social Collaboration Model

Case Study of Libya

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Contents

Abstract

Keywords: E-Government, Formal Institutions, Informal Institutions, Framework, Social Collaboration, Libya, chaotic Environment, E-Passport, Smart-PLS, SPSS

E-government is basically described as using all available electronic media to provide an online public services companies, agencies, citizens or persons in certain country or region. This provision can be provided by the government institutions, agencies, or organisation, in addition to public and private sectors subject to government policies and legislation. Political instability, armed conflict, corruption and chaotic situations are considered to be an obstacle confronting public services delivery and governance in some developing countries around the world. Therefore, Libya is selected a case study of this research.

Post the 2011 ousting of the Gadhafi regime in Libya, the country has been experiencing a severe and deep-rooted environment of conflict and chaos, which has destabilised and in some cases dismantled government institutions throughout the country. Within this environment, the original aim of this study was to explore the possibility of implementing e-government services that can provide public services to citizens and, if so, how and what services could be utilised.

An exploratory qualitative pilot study was conducted to investigate the feasibility of e-government implementation in Libya utilising the knowledge of

government officials. The study found that, the Libyan government had recently and successfully implemented an online e-passport service. An extensive literature review carried out in relation to e-government implementation to help understanding lesions learned and factors behind such success then to utilise the knowledge for further services implementations. Critical success factors of e-government implementation were addressed but available ones are related to stable countries under normal situations. This research is aiming to investigate its implementation in chaotic environment where not much of research is available. During the chaotic environment and instability, different factors may emerge to drive the implementation and the usage of e-services such environment. From government perspectives, it is noticed that cases of corruption, lack of citizens' safety and poor infrastructure were found to be drivers behind the success of existing government institutions and departments of implement e-passport system. Social collaboration and trust in government institutions' commitment were emerged from the citizens' perspectives as factors encouraged the citizens to use the e-passport system. Quantitative data analysed using structural equation modelling techniques using SmartPLS (3.2.7) together with the SPSS 23 were used to analyse the collected data. The outcome were used to propose a framework that can improve the implementation of public e-services while the country at unrest. Another contribution of this studies is the proposal of social collaboration model towards better e-services in such environment.

Declaration

I hereby declare that this thesis has been genuinely carried out by myself and has not been used in any previous application for a degree. Any valuable participation of others in this thesis has been acknowledged where appropriate.

Masoud M. Khamallag

Dedication

In memory of my parents who were looking forward to seeing this achievement and share with them these moments, but they have preceded me to the hereafter.

In memory of my only son (Monder) who passed away just before starting this study.

May Allah be pleased with them all and grant them the paradise.

To my loving wife (Fatma) for her patience and support.

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Nomenclature

CSF	Critical Success Factors
EGDI	E-Government Development Index
G-2-B	Government-to-Business
G-2-C	Government-to-Citizen
G-2-E	Government-to-Employees
G-2-G	Government-to-Government
ICT	Information Communication Technology
NID	National Identity Number
UN	United Nations

Chapter 1: **Introduction**

1.1 ***Background***

E-government has become a phenomenon over the past twenty years following the astonishing innovative developments and rapid increases in its use in the field of Information and Communication Technology (ICT) (Sajjad et al. 2011; Barbosa et al. 2013; Ahmed et al. 2015). Due to the rapid changes in this field, there has been a significant increase in the need to adopt these changes (Apostolou et al. 2011; Lallmahomed et al. 2017). Nowadays, the letter ‘e’ is associated to most of the day-to-day activities of commerce, learning, government, voting and democracy (Al-Nuaim 2009). Research established by Susan Kahzaeli and Daniel Stockemer (2013), who studied the period between 1996 to 2010, found that countries with higher internet diffusion and usage rates enjoy better, and have more stable, governance, regardless of the type of their governance regime. One of the studies in Arab countries, conducted by Al-Nuaim in 2009, found that each Arab country has its own structure of government and citizens are not conscious of who is doing what. She also found that the population in general, and especially women, are entering the workforce in more significant numbers in all Arab countries. Hence, there is a more extensive demand on local governments and authorities to favour the citizens (Al-Nuaim 2009).

The research started by gathering information as part of the literature review stage. Some factors were extracted for a better understanding of this area and

to assess whether they could represent critical factors of implementing e-government in a challenging situation. Because there are limited resources available in this area, the researcher felt it was useful to conduct a pilot study to explore and investigate the current situation of e-government in the state of Libya. Also, to consider the feasibility of e-government acceptance by the government officials and agencies. The pilot study targeted six people at different government levels. The aim was to obtain the government's official views by directly addressing its representatives in different governmental areas. The most critical and relevant conclusion from this initial study is that there is an excellent opportunity available to regional governments that can enable them to utilise available commitments of their people that can enable a collaborative and participative atmosphere by the anticipated support of e-government.

In this study, the researcher developed the research model based on an extensive literature review about e-government implementation and its related success factors. Then an exploratory pilot study conducted to explore the current situation in the state of Libya in the context of e-government implementation (Khamallag et al. 2016). A theoretical bases has been conducted through those two stages in addition to exploring the role of formal and informal institutions theory (Helmke and Levitsky 2004; Lebbadi 2015) which was used as lenses to analyse the collected data and develop the research model.

1.1.1 Country of Libya

Libya is one of the north-African Arab countries geographically located in the centre of the northern part of the African continent. It occupies a total land of almost 1.76 million square kilometres. Based on United Nation's statistics, the Libyan population is estimated at around 6.3 million (United Nations: Department of Social and Economic Affairs 2012). According to Miniwatts Marketing Group (2014), Tripoli, the capital city, contained 1,018,648 Libyan citizens in 2012, whereas Benghazi, Sabha and Misurata, the other three main cities in Libya, had approximate populations of 670,000, 600,000 and 550,000 people, respectively. The official language in the state of Libya is Arabic, but English and Italian are also well understood in the main cities. Politically, Italians displaced the Ottoman Empire in 1911 and made Libya one of the Italian colonies (Miniwatts Marketing Group 2014). This control and occupation of Libya lasted until the Second World War. In January 1943, the Libyan capital, Tripoli, fell to the Allied forces. Subsequently, Libya was put under United Nations' administration, until it was granted independence on 24th December 1951 (Miniwatts Marketing Group 2014).

Libya subsequently became a constitutional and hereditary monarchy under King Idris Snoussi in the period from 1951 to 1969. The political leadership during the monarchy was a mixture of religious, tribal and family elements of bureaucrats and university graduates (Obeidi 2001; Al-Werfalli 2011). However, the Kingdom period was terminated by a military coup, which was led by Colonel Muammar Al-Qaddafi in 1969. Thereafter, he became the

absolute leader who controlled Libya for more than four decades. The Al-Qaddafi regime regarded the tribe as a significant social organisation, which is the primary source of social values, and as a tool for education and socialisation. He believed that the tribe is a natural 'umbrella' for social security, and that it plays a role in the socialisation process. In support of this view, it was declared in 1993 that the tribe would be the source of legitimacy, with essential social functions and given the role of a formal part of the political scene in Libya (Obeidi 2001).

The period of 2010 and 2011 represented a significant milestone in the history of North Africa and the Middle East. Following the popular uprising in Tunisia and Egypt, the so-called 'Arab Spring' swept across the region. However, the situation was entirely different in Libya compared with the other countries in the region. A dictatorship regime had dominated Libya since 1969, in which all of the old adopted systems of regulations and institutions had been destroyed and replaced by a newly invented way of governing based on a people's congress, according to Al-Qaddafi's theory (Chivvis and Martini 2014). Four decades passed where the conditions of the Libyan state were very complicated under a corrupt regime, according to United Nations' reports for several years. Since 2011, the chaos that accompanied the revolution against that regime and the subsequent armed struggle for power in the absence of state institutions, created the atmosphere for corruption to increase (International-Transparency 2013; Chivvis and Martini 2014).

As for the Arab Spring revolutions, in Libya these could be defined as a widespread movement that spread across the country to demand wide-ranging change. This was helped to gain legitimacy and momentum by the aggressive actions of the regime, which led to higher demands and international interference until the regime collapsed (Abdelbaki 2013).

From the history mentioned above and the facts cited about Libya, it is clear that this country has gone through an interval of time where the government institutions, which started during the monarchy era, were replaced entirely with a fragile system that collapsed as soon as the regime disappeared in the 2011 revolt. This situation required the re-building of the institutions from scratch, based on the rule of law and digital systems, through the help of e-government initiatives that have proved to be successful in developed countries and many of the developing ones, too.

1.1.2 Unstable situation

Since the uprising in February 2011, Libya has become an unstable country. According to the Fund for Peace website, Libya has been ranked in the top 25 worldwide fragile states in the Fragile States Index report for 2015 and 2016 (Fund-for-Peace 2016). Libya is also ranked as -2.32 in the most unstable countries in the Global Economy website's 2014 data, where the highest value was Liechtenstein at 1.54 and the lowest value was Syria at 2.76 points (Neven Valev et al. 2014). Libya has been considered to be highly politically unstable, and the security situation is correspondingly fragmented, especially in the post-Gadhafi regime (IIS 2016). According to the Global Security Index

report (2016), Libya was reported within the top 20 of countries that were predicted to be at risk of experiencing highly violent conflict (Smidt et al. 2016).

1.1.3 E-government in Libya

Libya faced a long-term world embargo which began in 1988, due to the old regime's political conflict with most of the western countries. The period of sanctions and isolation started and lasted from 1988 to 2001, despite Gaddafi's move to embrace African diplomatic interventions (Campbell 2012). During that period, there were no communications and no trade exchanges with western countries, apart from some neighbouring Arab and African countries who obtained mutual benefits, but these were local and insufficient goods exchanges took place (Campbell 2012; Chivvis and Martini 2014). The grip of the security forces was at its most intense upon Libyans during that period, to suppress any revolution or uprising, given the poor state of living of most individuals. Work on infrastructure was banned and stopped due to these sanctions.

During the last decade, Libya has started to establish a communications infrastructure and announced its e-government portals for specific institutions. According to Saadi and Almahjoub (2012), e-government implementation in Libya has not achieved the desired aims and there is vast scope for the development for such projects. They concluded that E-Government could be quickly set up in Libya, because of it has a low population and there is a high literacy rate among the citizens (Hassan et al. 2013; Saadi and Almahjoub 2012). Thus, careful planning, intelligent utilisation of resources and

government-centric focus can boost the process of making Libya a developed country in this respect. However, as the implementation of e-government involves making all of the government services available and accessible anywhere and everywhere, it is necessary to take into consideration the issues of privacy and security. As E-Government security is considered one of the crucial factors for achieving an advanced stage of E-Government, much needs to be done in this field (Hassan et al. 2013; Saadi and Almahjoub 2012).

According to the United Nations' e-government survey report on the E-Government Development Index (EGDI), sometimes known as e-readiness, which is an indicator for measuring the level of government usage of ICT for services delivery, Libya was in the middle position (between 0.25 and 0.50) in 2014 (United Nations 2014). The measure comprised two upper levels, very high and high, at more than 0.75 and 0.50 - 0.75, respectively; and a low level of below 0.25. This report has been updated once a year by the United Nations Public Administration Programme (UNPAP) since its creation in 2003 (United Nations 2014). It indicates that there is work that needs to be carried out, mainly on reviewing the legislation and policies related to e-government initiatives. Regarding the infrastructure, it is clear that most of the projects which were established just before the 2011 revolt have been suspended up to now (2017), and the war and civil conflict have also destroyed some of the existing infrastructure. In the last democratically elected government after the revolution, the deputy Minister for Communications and Informatics claimed that the Libyan government was focusing on E-Government as a public

services delivery tool by introducing and using the ‘e-Libya’ initiative (Questex Media Group LLC 2014).

The state of Libya started some initiatives at the middle of last decade were they put some ministries’ activities online and the National I Dentity Number - NID and e-passport project initially started in 2008 (Saadi and Almahjoub 2012; Hassan et al. 2013). The real implementation of the NID and E-passport project started after the uprising ended (IRB 2013; NID 2015).

1.1.4 UN classification for the years 2012 and 2016

The online services components measured by the United Nations (UN) uses the E-Government Development Index (EGDI), which is an indicator for measuring the level of governments’ usage of information technology to ensure the delivery of services to their citizens. This index is an outcome of a complete study of the existence of online services in all UN members. The study evaluated all the websites used for services delivery from the perspective of related policies and quality of the services (United Nations 2014). Libya can be found in the fifth position among the upper-middle level of the list. It has been given the rank of 121 out of 193 in 2014, which is an increase of 70 places when compared to the previous level of 191 in 2012. This demonstrates that after the revolution the government started to initiate e-government policies and establish some online services. The figures mentioned are illustrated in the following table (1), which has been adapted from the United Nations’ report in 2014 (United Nations 2014).

Table 1-1: E-Government Development Index (EGDI), Source United Nations (2014)

Country	Level of Income	EGDI	2014 Rank	2012 Rank	Change in Rank
High EGDI					
Egypt	Lower Middle	0.5129	80	107	↑ 27
Seychelles	Upper Middle	0.5113	81	84	↑ 3
Morocco	Lower Middle	0.5060	82	120	↑ 38
Middle EGDI					
South Africa	Upper Middle	0.4869	93	101	↑ 8
Botswana	Upper Middle	0.4198	112	121	↑ 9
Namibia	Upper Middle	0.3880	117	123	↑ 6
Kenya	Low	0.3805	119	119	-
Libya	Upper Middle	0.3753	121	191	↑ 70
Ghana	Lower Middle	0.3735	123	145	↑ 22
Rwanda	Low	0.3589	125	140	↑ 15
Zimbabwe	Low	0.3585	126	133	↑ 7
Cape Verde	Lower Middle	0.3551	127	118	↓ 9

1.2 ***Significance and motivation of the research***

Because of the research environment was risky and challenging, conducting a study about e-government implementation in such environment is a significant and an addition to the body of knowledge.

Recently, e-government services have become a popular government environment to interact and communicate with both citizens and government agencies and institutions all over the world. These online services are essential media for citizen-government collaboration and are considered to be informal virtual communities, which are linked together through the common areas of interest to overcome all different types of barriers, such as distance and time (Weber and Kim 2015). Within these type of services, citizens with different levels of knowledge and skills usually collaborate and share their experiences with each other informally within their communities (Russell et al. 2013).

Therefore, during political instability and unsafe environments, this type of sharing and collaboration is found to be an important factor for government institutions to offer e-services, as they are safer for citizens to use in comparison to face-to-face services delivery (Khamallag et al. 2017). Hence, this study was motivated to provide a better understanding of the possibilities for e-government implementation in a chaotic environment where there is limited access to all infrastructure components and fragile government institutions.

1.3 ***Research Questions***

This research is aimed to answer the following questions:

1- What is the prospects of e-government implementation in chaotic situations and absence of the state?

2- In the case of Libya, what made e-passport succeed? What are those learned lessons from this exercise?

3- What is the role of informal institutions when implementing e-government in unstable state?

4- How can the implementation of e-services be expanded when considering the success story of e-passports in Libya?

5- Is it possible to conduct a supportive framework that can help governments and agencies to implement e-government services while the country suffers from chaos?

1.4 ***Research aims and objectives***

The following aims were addressed through one pilot study and two other primary studies. The first pilot study was an exploratory study conducted with several government officials to explore their perspectives.

- The thesis aimed to explore the perspectives of e-government implementation in a country which faced riots and instability.

- To establish a framework which could be used as a guideline for the implementation of e-government services in a chaotic environment.
- To concentrated on those factors that are an essential need during conflict and the absence of government.

It provided the opportunity to answer the 'what' questions: what is there and what kind of opportunities are available? These questions answered by interviewing a number of government officials to view their perspectives about the current situation and e-government services. The first pilot study resulted in the emergence of several themes: corruption, infrastructure and the main theme, which was the e-passport – an implemented e-service. The latter was used as the case study of this research.

While the main objectives are:

- To find what are the citizens' opinions about the e-passport services? Another qualitative study was conducted. It collected the citizens' perspectives about the e-passport system by interviewing several citizens.
- To follow the success story of the e-passport and creating a roadmap in a form of a framework that can be used for implementing other e-services during the chaos.

This study aimed to find the answer to the 'what' and 'how' questions. The citizens' responses supported the previous findings and added another two new factors: 'Citizens' Social Collaboration', which the participants believed it

was behind the success of e-passport implementation. The other factor is 'Lack of Citizens' Safety' which is believed to drive this collaboration. The second study also agreed with the first in that the poor infrastructure and cases of corruption, which spread after the riots (International-Transparency 2013), were the reasons that drove the existing formal government institutions to go ahead and implement the e-passport and national number systems. Then, how this essence of collaboration can be utilised in the implementation and the usage of the e-government services during the chaotic environment. How the existing formal institutions' departments can be motivated to commit to the implementation processes regardless of the situation on ground.

Finally, to test those factors with another method to finish the triangle and be ready to formulate a framework for e-government implementation a third study was undertaken to test those findings with a more substantial general sample using an online survey. Approximately one thousand people participated in the survey from all over Libya. The objectives of the third study were to answer the 'why' questions by collecting the citizens' opinions and attitudes regarding several questions designed as a Likert scale based on the findings from the previous two studies. The thesis also highlights the role of informal institutions represented by the social collaboration like friendship, colleagues, family members and relatives (Mohmand 2016) in using the e-services.

1.5 ***Research approach***

The research guided by the mixed methods approach (Creswell 2014). Qualitative and quantitative methods applied on the emerged case study (Creswell 2003, 2007, 2014). Starting from the data collection phase and concluding with the analysis phase. It involved several instruments which can be used in data collection, such as structured interviews and questionnaires (Saunders et al. 2009; Bryman 2015).

This thesis comprises of three main studies; pilot study, qualitative study and a survey. The literature review examined e-government implementation and the critical success factors (CSFs) involved. Firstly, a qualitative pilot study was conducted with government officials to formulate the government perspectives. Then, this study was pattern matched with the findings from the literature review regarding the CSFs. Secondly, based on the findings from the government perspectives, another qualitative study was conducted with citizens to formulate their perspectives about the e-passport implementation in Libya during the current situation. Finally, a survey was designed to test the model formulated from the findings of those two studies, to collect citizens' opinions and attitudes regarding e-government implementation of services represented by e-passports. Structured interviews were used for the first two qualitative studies, the exploratory pilot study and citizens' perspectives study. They were both designed to uncover the government and citizens' perspectives about the e-government initiatives in the state of Libya. Both interviews were conducted using the local Arabic language.

Thematic analysis was followed to analyse the interviews after transcribing and translating the contents into the English language. NVivo 10 was used as a data management tool, which helped in configuring and linking themes with corresponding data in the transcribed interviews.

Lastly, a questionnaire was designed to collect the opinions and attitudes of citizens about the usage of the e-passport system and e-government services in general. The questionnaire was constructed using tested established instruments from the literature and was placed online. The collected data was used to test the hypothesis; firstly, using SPSS V 22 for data manipulation and recoding, and secondly, Partial Least Squares Structural Equation Modelling technique SEM-PLS was employed using Smart-PLS v.3.2.7 (Marko Sarstedt, Christian M. Ringle 2017).

This research started by literature review to explore the e-government topic and then decided to conduct the case of the state of Libya to be taken as a case study. The state of Libya which suffered from a chaotic environment since the uprising in 2011 and the destructions to the regime and its institutions. The e-government initiatives in the state of Libya started in the beginning of the last decade (Saadi and Almahjoub 2012). Exploratory pilot study was conducted to explore the current situation and the prospects of e-government implementation in the state of Libya. This stage was to collect the government perspectives about the current situation. The next stage another qualitative study conducted with citizens to formulate the citizens' perspectives. Final stage includes a survey distribution to collect the citizens' general attitudes

about the e-passport system and the analysis phase which emerged the framework for e-government implementation in chaotic environment. Figure 1.1 illustrates the research phase's outline.

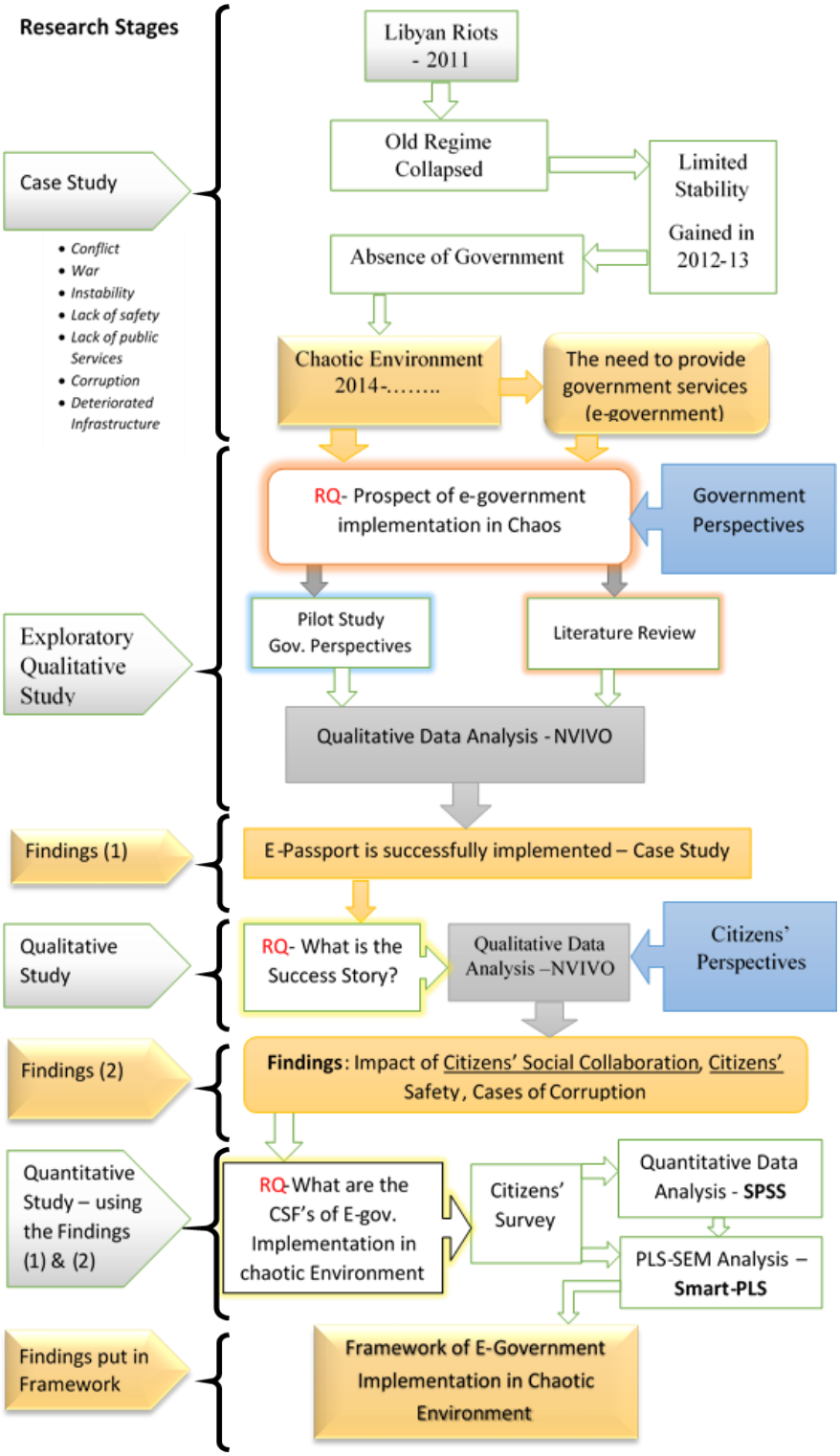

Figure 1-1: Research Phases outline

1.6 ***Contribution to the literature review:***

Although conducting empirical studies about e-government implementation in a chaotic environment was risky because of the local and global situation, the fact that it has been conducted successfully is a contribution. In the literature, there is a lack of such studies which focus on e-government implementation in chaotic environments. The following are the contribution of this study:

1. The framework formulated from this study could be adopted to be used for any other areas to follow the success story of e-passport implementation.

2. The comprehensive study of the e-government implementation, CSFs, provides considerable information to help researchers conduct further studies.

3. The new CSFs emerging from this study have added value to the body of knowledge concerning e-government implementation in a chaotic environment and are a point of focus.

4. Despite the circumstances on the ground and unexpected situations which can arise at any time, the citizens have still applied for their e-passports utilising the spirit of collaboration among themselves. Hence, the social collaboration model formulated from this study can encourage formal institutions to depend on informal institutions to spread the culture of reliance on the use of electronic services among citizens.

5. The commitment of the formal institutions' departments in their daily work can achieve a great deal when governments are fragile and dismantled. This commitment needs support and encouragement from all parties including international players, through the UN agencies.

1.7 ***Thesis outline***

This thesis consists of seven chapters and four appendices. The contents of each chapter and each appendix are illustrated in the following sections.

1.7.1 Chapter 1 – Introduction

This opening chapter introduces the thesis contents, layout and phases. It also provides the aims, objectives and research contribution. Furthermore, it includes the research methods used for all the data collection phases of the research. It provides a general context and idea about the research case study. Firstly, it briefly introduces the historical background of e-services in general and in the state of Libya, which is the topic of the case study. Secondly, it examines the unstable situation and the reasons behind this environment. Thirdly, it introduces the e-government implementation initiatives before the uprising, over the last decade. Fourthly, it introduces and defines e-passports and the idea behind the process. Finally, the chapter highlights the current situation in the state of Libya through United Nations (UN) reports, which classify states based on the e-government readiness among their regions.

1.7.2 Chapter 2 – Literature Review

This chapter provides comprehensive details about the topic of e-government implementation in the literature worldwide. The experience of the developed and developing countries in the context of e-government adoption, implementation, and usage of e-government services is covered. Also, it provides an introduction and definition of e-government implementation CSFs that have been collected and introduced in this research. It introduces the meaning of corruption and the role of e-government in this context.

1.7.3 Chapter 3 – Research Methodology

This chapter introduces the research methodologies in general and focuses on the approach followed by the researcher in this study. As with any research which involves others with either interviews or surveys, there are several guidelines and methods that should be followed by the researcher to reach the optimum results. In this chapter, there is an introduction to interpretivism and positivism and an explanation of research experts' findings in this context. The chapter also introduces the informal and formal institutions, together with a thorough examination of the theory of institutions and how it is linked to the current research.

1.7.4 Chapter 4 – Analysis of Government and Citizens' Perspectives Qualitative Studies

This chapter provides two detailed study analyses for the qualitative studies conducted with the government officials and citizens. Firstly, it opens with the

government perspective pilot study, which was conducted at the beginning of this research to explore the current status of e-government in the state of Libya. Then, the results are pattern matched with the literature review findings of the CSFs. Secondly, the citizens' perspectives qualitative study is discussed in detail and the findings presented. Thirdly, a summary of the findings of government perspectives and citizens' perspectives is presented at the end of this chapter.

1.7.5 Chapter 5 – Research Model and Quantitative study

This chapter provides the reader with the formulated research model which was designed based on the output of chapter four. It introduces the survey questions, the hypothesis and the constructs involved in the model. The comprehensive analysis is reported and the hypothesis is tested using Smart-PLS package, which deals with the SEM methods, as discussed in chapter 3.

1.7.6 Chapter 6 – Discussion and Analysis

This chapter comprises a detailed discussion highlighting the findings of the research. The model components are introduced and thoroughly discussed. The framework of implementing e-government in chaotic environment is presented.

1.7.7 Chapter 7 – Conclusions and Further works

Finally, this chapter concludes the thesis and shows the limitations of the study, the contribution to the body of knowledge, and future work are presented at the end of this chapter.

1.7.8 Appendices

Appendix A: Government officials' interview questions and consent form

Appendix B: Citizens' perspectives interview questions

Appendix C: Survey questions

Appendix D: SPSS Frequency Tables

Chapter 2: **Literature Review**

2.1 ***Introduction***

The main aim of the literature review is to identifying gaps and problems thoroughly and build on existing knowledge. In this chapter, the literature on the two central concepts are examined, namely, e-government and corruption. E-government is illustrated with a framework based on the theoretical background. It starts by giving several definitions of the e-government concept, as well as introducing corruption and its dimensions. It concentrates on the importance of adopting and implementing e-government to increase the level of transparency and accountability among government institutions and agencies. Finally, this chapter focuses on the impact of corruption and lack of online systems on chaos, conflict and civil war crises in developing countries, and examines how the process of introducing e-government portals can help governments to reduce that effect.

2.2 ***E-government background and future perspectives***

2.2.1 What is e-government?

The terms ‘digital government’, ‘electronic government’ or ‘e-government’ have no specific definition. It is difficult to define these terms from one perspective, as there are different views from different areas by different viewers (Heeks and Santos 2009). According to the literature, several definitions of e-government

have been addressed in various contexts. For example, the World Bank (2009) defined electronic government as, “The usage of Information Communication Technology-ICT, mainly to enhance public services delivery and business processes of all the institutions and agencies of any government”. Tamara Almarabeh and Amer AbuAli (2010) posited that e-government is not only web application portals or network systems, it is a platform for government transparency, citizens’ participation, as well as government accountability (OECD 2010).

In the twenty-first century, e-government provides an excellent opportunity to move the relationships between governments and citizens forward, and provide the population with high quality and efficient public services in line with adequate financial resources (Heeks 2005). Thus, e-government is proved to be a dynamic continuous service provision process. This e-service utilises ICT to make the services accessible to all citizens, with the multi-channel delivery of public services within an effective and efficient management process (Shareef et al. 2010; Heeks 2005). On the other hand, e-government and e-democracy make the citizen’s contribution to the government more valuable, noticeable and much more efficient (Holzer and Kim 2005).

This type of study, which is related to E-government, can be approached from three different views as follows:

i. Technical angle: this approach mainly tries to look at E-Government from the technology aspect and answer any related questions. For example,

questions related to designing the business processes, software, hardware and protocols that should be used and applied (Heeks and Santos 2009). Several academic and research areas use this approach, while in the public administration area it is seldom used (Calista Donald J.; and Melitski 2007). E-Government has been approached from a technology perspective in an attempt at research from the views of a different school of thoughts. E-Government presented a technology revolution, without sufficient consideration of the political and organisational administration angles as facilitators for E-government's successful dissemination (Dawes 2009).

ii. Techno-social angle: this perspective focuses on E-Government from the process side, which is extensively used and practised in different research theories related to the dissemination of information systems. This perspective has been utilised mainly to uncover the main reasons which influence the diffusion of ICT and evaluate how those technical and social issues are important in this type of study (Heeks and Santos 2009).

iii. Socio-political angle: political or governmental science describes this angle, which addresses how to utilise ICT to enhance public administration research (Niehaves 2007). It perceives e-government as an organisational system in a social-political context, where it focuses on its contribution to the public; for example, reforming public administration

and decentralisation, which can be bridged through electronic services (Irani et al. 2007).

E-government is an ICT governance model to be utilised for services delivery to citizens and other stakeholders in a convenient way (Heeks 2006). As methods of governing keep changing and governments become more approachable, the citizens need to participate more efficiently in the entire process. This demands a high level of transparency and accountability among government agencies and institutions (Heeks 2006).

2.2.1 E-Government vs Digital Government

E-Government, though some consider it an outdated term, is perceived as one-way channel to provide government services in electronic format achieving affordability, less bureaucracy, timely and open to all among others. Digital government is argued to be its rebranding. Andrea Di Maio argued there is progression from e-government, to the joined-up (or citizen-centric) government, to the open government and finally smart government (i.e. affordable, sustainable and cross-boundary). Also digital government implies both open government and smart government principles, and is indeed very well distinct from e-government. He also argued that US open policy, UK digital strategy, Danish approach to data and in many developments across the world, differences between e-government and digital government are becoming apparent stating that digital government is NOT a rebranding of e-government, nor are the governance and architectural

changes cosmetic (Maio 2013). In this thesis the term e-government is used to express the electronic government or digital government.

2.2.2 Why E-Government?

People are not ready to spend time, effort and money to travel to a government agency if they can finish their task by a click of the mouse while they are doing other activities at home (Xiong 2006). E-government is also considered as a tool for measuring the efficiency and quality of the government services provided and cost reduction (Layne and Lee 2001). Based on the latest model of Janowski (2015), the e-government concept has continued to grow because of a continuous twenty years of significant research and practices all over the world, as all governments worldwide are under pressure economically, politically and socially. This concept shows the significant position of the inevitability of this process, in order to understand the current situation and predict the possible future changes to support policymakers, government executives and researchers to prepare and evaluate a proper strategic plan for adopting and implementing E-Government (Janowski 2015).

2.2.3 The emergence of e-government

In the last two decades, electronic government has become state-of-the-art and has been adopted and recognised globally. It has been developed and utilised up to the best possible standard by the developed countries to provide high-quality services to the public in a transparent and accountable manner (Bertot et al.

2010). Whereas, some of the unindustrialised countries are still struggling, and others are still at the stage of starting the initiation process of e-government legislation and strategies, together with international donor agencies who are providing help and support (Ahn and Bretschneider 2011).

E-government promises to establish and promote government performance, which leads to the development of the population economically and socially through efficient and effective government and public administration (Bertot et al. 2010; Bhatnagar 2003). The innovative developments of ICT are positively impacting on many aspects of people's daily activities by making, facilitating and enabling media and communications to be available to all to utilise (Bhatnagar 2003). Establishing a well-developed infrastructure for communications and ensuring the availability and suitability of a media infrastructure empowers the stability of public interaction simultaneously (Homburg and Bekkers 2002).

Continued efforts to convert governments to ICT-enabled governments has led to the emergence of the terms e-government and E-Government to keep pace with these developments and technical transformation. Thus, e-government has become a focal point for all government agencies and institutions, as well as many researchers in this area (Eifert and Püschel 2004). The developed countries' experiences have shown that it enhances and facilitates all of the government services and partnerships both internally and externally. These government services are provided and delivered in an efficient manner to the citizens, as well as to the local and regional institutions and agencies (Gorkey-

Aydinoglu and Ozdemir 2015). On the other hand, it is not possible to generalise this case in the developing countries, such as Libya and other neighbouring states. Although considerable trials were implemented in the last decade, they still face inefficiencies and the lack of the necessary infrastructure needed for this type of innovation (OECD 2010).

2.2.4 What is e-passport?

Randy Vanderhoof is an expert in smart card technology and a US government advisor. According to his website (2006), which talks about smart cards in general, the e-passport can be defined as a travel document with an embedded microchip that stores the holder's information to prove identity at borders, boarding gates and airports (Vanderhoof 2016). The passport has gone through several development stages, starting from the handwritten document with a photograph, up to the modern development of an electronic chip containing several elements of biometric data about the holder. The biometric contents vary from one country to another, but the standard is based on the requirements of the International Civil Aviation Organisation (ICAO) (Vanderhoof 2016). According to the e-government portal of the United Kingdom, the passport office first introduced the e-passport in 2006 and then updated it in 2010 and 2015 to include a microchip with the holder's facial biometrics (GOV.UK 2016).

In Libya, the report issued in 2014 by the Ministry of Foreign Affairs announced the introduction and implementation of the NID number and the e-passport (Ministry of Foreign Affairs 2014). Based on that announcement, the Passports

and Citizenship Office started the process of issuing e-passports for Libyans who hold NID numbers. However, the chaotic environment has cast a shadow on the entire issuing process and resulted in several instances when the issuing processes stopped in some cities for months and in others for years.

2.3 *E-Government classification*

Because of the growing of the potential benefits of technology for fostering the e-services, it agreed upon several scholars that the e-government could be classified in certain classifications as a new paradigm of governance needed. This paradigm is focusing on empowerment and engaging of citizens in the government processes (Dash and Pani 2016; Pandey and Gupta 2017). E-Government can be grouped or categorised according to the relation between the government and their participants from the perspectives of information technology in the following models (Christensen and Lægreid 2007; Gyaase and Kwadwo. 2014):

- G-2-B: (Government-to-Business) - The relation between governments and businesses.
- G-2-C: (Government-to-Citizen) - The relation between governments and citizens.
- G-2-E: (Government-to-Employees) - The relation between governments and their employees (Christensen and Lægreid 2007; Gyaase and Kwadwo. 2014).

- G-2-G: (Government-to-Government) - The relation between governments and other governments, or institutions and agencies within that government.

In the following sections there will be a brief overview of each model:

2.3.1 Government-to-Business model (G-2-B)

This represents the communications and interactions between government and all of the related private and public business bodies in a way that utilises the technology in all relevant aspects (Finger and Pécoud 2003). This could assist economies in the developing world, in which government procurement and financial processes are suffering from fraud and are not free from corruption. This causes government institutions a considerable loss. G-2-B has proved its ability to cope with this issue and help governments to control the abuse and misuse of power by promoting the principles of transparency and accountability among government institutions and agencies (Moon 2002). To improve the management of documents, shopping, delivery of services, cost and time reduction, and increase transparency in the public decision-making process, governments build these type of portals as an e-procurement process (Heeks and Mathisen 2012), and ensure they are located in a place where they are accessible by all, where all types of feedback can be monitored (Michael and Mendes 2012; Charoensukmongkol and Moqbel 2014).

2.3.2 Government-to-Citizen model (G-2-C)

This refers to the style of e-government that focuses on citizens' requirements and needs. This type of scheme provides the free, unrestricted online availability of government information on request, providing all of the e-services which meet public requirements, whilst in the meantime allowing citizens to participate in government affairs fully (Gyaase and Kwadwo. 2014). This process is performed through online government systems including hyperlinking portals to facilitate the different public services available (Ebrahim and Irani 2005). The G-2-C model creates cooperation between the government agencies on one side with citizens, different democratic parties and other agencies on the other side, who are able to participate in different political aspects of government, such as e-voting (Edmiston 2003). Although many attempts have been made by some of the developing countries to reproduce similar E-Government models, empirically there are insufficient research studies in this context at present (Gyaase and Kwadwo. 2014).

2.3.3 Government-to-Employee model (G-2-E)

Governments worldwide usually hire a considerable number of people to accomplish and implement their strategies to achieve set aims and objectives. The G-2-E model describes the technical part of this interaction between the government and its members of staff to guarantee that the government supervision is efficient enough to monitor the employees' day-to-day activities and requirements. The coordination, effectiveness and efficiency are monitored

by internal and external government agencies to ensure the quality of the services delivered (AlAwadhi and Morris 2009).

2.3.4 Government-to-Government model (G-2-G)

This model explains the provision of services and the interaction of the government agencies with each other, utilising innovative technical media to the maximum. This method of relationship safeguards all government institutions from being in a situation of dispersing efforts and losing resources (Christensen and Lægreid 2007). The implementation of E-Government provides the government departments with the possibility of making their resources accessible to the public, and facilitate the communication between the federal government to the local ones, to create an efficient environment for decision makers to work, where this process is not possible manually (Christensen and Lægreid 2007). This model also facilitates the base for participants, both national and local government authorities, to join together to share their practices (ITU 2008).

Gyaase and Kwadwo (2014) claimed that although these classifications create the ability to understand the possible relations which might appear between the government and all other participants, this is dependent on the maturity of the E-Government in that specific country. As the e-government topic is still in the early stages, especially in the developing countries, and there are insufficient empirical studies in this context, the e-government models mentioned might not be evident (Gyaase and Kwadwo. 2014).

2.4 ***Corruption***

Corruption is defined as the misuse of given power to gain private reimbursement. It can take a variety of forms: bribery, embezzlement and gifts, and can happen anywhere and everywhere on macro or micro levels (Charoensukmongkol and Moqbel 2014; Bardhan 2006). Corruption at both levels involves the distortion of government expenditures, and at the macro level, the resources allocation made by politicians or high-level government authorities are for their own gain and benefits. On the other hand, corruption at the micro level is usually done by low-level government authorities who are responsible for local services delivery. This is classified as bureaucratic corruption (Shleifer and Robert W. Vishny 1993; Charoensukmongkol and Moqbel 2014).

It has been argued by several experts in the fields of corruption, economics and e-government that no single country worldwide is free of the corruption phenomenon. However, the difference is its severity, fluctuation and rootedness level, which varies from one country to another (Kim et al. 2009; Shim and Eom 2008; Sutherland 2014; Heeks and Mathisen 2012; Asogwa 2013; Shleifer and Robert W. Vishny 1993; Gyaase and Kwadwo. 2014). In support of the above-mentioned cases, and according to the Corruption Index, in (2013) and (2016) there were a score of 177 and 176 states worldwide, respectively, were scored and categorised from 0 to 100. The scores indicate low to high corruption levels. This index revealed that 65% of the countries scored below 50 and no country achieved 100% corruption free (International-Transparency 2013, 2016). This

indicates that corruption is a severe issue worldwide (Shim and Eom 2008). The researcher was not surprised to find that the latest report (2016) ranked Libya at 170 out of 176.

2.4.1 Chaotic environments and corruption

Based on the above, countries which are politically and economically developed and stable have been unable to achieve the ideal situation in their daily transactions, which is to ensure that they are free of corruption. This is worse for developing countries which suffer from chaotic situations and civil conflict. Based on Bateman et al.'s (2016) report on the Afghanistan crisis, corruption can cut across all efforts of maintaining stability and reconstruction, jeopardising citizens' safety and security, governance, the rule of law and the desired economic growth (Bateman et al. 2016, p.3). That will make this research more interesting, valuable and challenging at the same time.

2.4.2 E-government and its impact on corruption

Based on Luminita Ionescu's (2013) research, curbing corruption is one of the main aims and objectives of E-Government through improving the quality of public services delivery. E-Government has the potential to develop social capital and increase anticorruption behaviours through public involvement and participation. The use of e-services is considered to be a milestone in the process of reducing corruption by opening a competitive environment among the government agencies and stakeholders to encourage them to adopt and

implement online public services delivery (Ionescu 2013; Kim 2014; Zhao and Xu 2015). Citizens' involvement in decision-making and service delivery processes could be an effective means to reduce corruption in the decision-making and service delivery process, through technical adaptations and adopting E-Government initiatives (Elbahnasawy 2014; Bertot et al. 2010; Michael and Mendes 2012; Prasad and Shivarajan 2015). The more of using e-government to reduce face-to-face interactions with public officials as well as providing more opportunities for public officials to report bribe offerings in a safe and confidential way; the more citizens will change their attitudes towards bribery (Ivlevs and Hinks 2018).

The World Bank (2014) strongly recommended e-government as an effective strategy to be taken to reduce corruption and enhance government efficiency (World Bank 2014). Eom and Shem (2008) found that a higher level of e-government adoption by a country was associated with a more significant reduction in perceived corruption in that country (Shim and Eom 2008). Although e-government's objectives are to deliver services to citizens more efficiently and effectively, it is also considered to be a tool for fighting corruption (Prasad and Shivarajan 2015). These researchers also drew the attention of policymakers to the importance of devoting their efforts to increasing the interactivity of government websites (Prasad and Shivarajan 2015). In addition, Satish and Teo (2012) found that the rule of law was significantly associated with e-government development in a positive direction. They stated that the rule of law is not only crucial for a nation's socio-economic development, but also lies at the crux of

ICT-led development efforts. They added that a government's effectiveness indicates that a country's E-Government development will progress and reach the stage of maturity only when its national institutions are well established and have a clear and practical vision.

There are specific unique challenges which face electronic government projects, particularly in the developing countries, that have not been identified efficiently and explored, such as the impact of civil conflict, violence, chaotic situations and the digital divide in this type of project. For that reason, understanding the complex nature of these societal issues is very important for the delivery of E-Government services (Khan et al. 2011). Civil conflict and violence have numerous consequences for the countries that suffer them, including economic, environmental and psychological issues. The question arises as to how all these issues are linked to corruption and whether there is any relationship between corruption and conflicts and chaos. However, there is a lack of research addressing these issues, especially the impact of E-Government adoption and implementation on conflict and chaos situations. It is essential to promote awareness among citizens, agencies, and government officials and institutions about the real impact of corruption, especially for countries suffering from post-conflict and civil-war situations (Bateman et al. 2016; Ivlevs and Hinks 2018).

Therefore, this factor is selected as part of this study to explore it's relation to citizens and government perspectives of implementing e-government as well as its impact on the e-government implementation.

2.4.3 The mechanism of anti-corruption within E-Government

A study was conducted in Seoul Metropolitan Government by Kim et al. (2009) on the “Online Procedures ENhancement for civil application” (OPEN). Their findings were as follows: (1) A positive impact has been created by OPEN on the reduction of corruption in the area of this study. (2) Implementation of solid regulations and policy packages is one of the most effective mechanisms in implementing anti-corruption systems. (3) Active management and leadership together with the intention of fighting corruption should be embedded within the system as a whole (Kifle et al. 2009; Ionescu 2013). Based on these findings, the last two factors are crucial issues, which apply to any work, especially when dealing with fighting a widespread phenomenon like corruption.

Kifle et al. (2009) claimed that electronic government is rapidly being used to enhance the principles of transparency and accountability among government sectors in order to fight corruption in Seoul, Korea, and has led to the establishment of an anti-corruption system (Kifle et al. 2009; Kim 2014). Shim and Eom (2008) believed that E-Government is a successful means to fight corruption through building robust governance instruments and strengthening the change process. They also added that electronic government could control corrupt behaviour by enhancing the monitoring process and building a healthy relationship with citizens. Creating a healthy relationship between administration, policies, governments and businesses is vital and should be an accountable issue (Choi 2007).

Elbahnasawy (2014) empirically found that E-Government is a powerful tool in reducing corruption via a vast telecommunication infrastructure, and the scope and quality of online services is strengthened by greater internet adoption. The integration effects of e-government and internet adoption both complement and support each other in anti-corruption programmes. E-government would provide quicker access to government information, minor administrative expenses, increase transparency and accountability in government ministries, and reduce bribery and corruption (Asogwa 2013). Harnessing ICT to transform relationships with citizens and businesses and between the branches of government will lead to a reduction in corruption, an increase in transparency, higher revenues, and finally lower expenses (Asogwa 2013).

Therefore, E-Government helps the government to be transparent and lead it to be accountable which will positively contribute to the corruption fighting.

2.4.4 Impact of transparency on corruption

One of the e-government objectives and advantages is to create the roles of efficiency, effectiveness and transparency in all government institutions and agencies (Heeks 2005; Visser and Twinomurinzi 2008; Heeks and Mathisen 2012; Ionescu 2013). Transparency is an essential element for any government to promote openness and reduce corruption. A lack of transparency can lead to:

- Creating a culture of corruption and making it more attractive and secure.

- Raising a sense of irresponsibility among the government officials by avoiding the use of public incentives.

- Limiting the possibilities of a human resources selection procedure, which should target efficient, honest and qualified personnel for the public-sector positions.

- Impacting social trust which will delay the development of the public's interest (Bertot et al. 2012).

According to Mancini and O'Reilly (2013), studies that have been carried out in many countries in Africa and Asia found that the role of new technology in a stable situation is crucial amid unprecedented growth in access to information communication technology. Therefore, continued extensive research and systematic evaluation are strongly needed for a deeper understanding of the realities and to explore the possibilities (Khan et al. 2012; Mancini and O'Reilly 2013). E-government is the focal point of the new technology mentioned, but it is still not sufficiently mature, especially among the developing countries. Researchers have explored the real factors that are influencing e-government adoption and, at the same time, its implementation in the developing world (Weerakkody et al. 2011). Finally, e-government services for transparency by opening data and information empower citizens to monitor government operations, and this mechanism can be more easily achieved than more costly endeavours for enhancing political and economic capacity (Nam 2018). From that, the researcher has been encouraged to explore how e-government can be

implemented in a chaotic environment and civil conflict situation by trying to address those factors that can help to achieve that.

2.5 ***E-government initiatives in unstable countries***

According to Choudrie et al. (2017), the barriers which disrupted the full success of e-government implementation in Nigeria is the power blackout. This is a regular phenomenon in the Nigerian towns, villages, and cities which is similar situation compared with the case of Libya. Therefor this technical problem impact negatively on the robustness of ICT. Although, most of the telecommunication stations are equipped with portable power generators, but because of lack of safety and absence of the government security institutions these generators are easily exposed to theft and tampering with its contents. Hence, the cost of providing these generators, maintenance and their protection is dramatically increased (Choudrie et al. 2017).

Palestine is another example considered to be a complex political environment which suffers from instability and conflict for a long time. They realise that e-voting is needed which would increase citizens participation and improve Palestinian democracy. It finally concluded that there is a possibility to implement e-voting within the local institutions and gradually spread the idea to be adopted for the country election process (Shat and Pimenidis 2017).

If we include Syria as a country suffers from conflict and civil-war since 2011, there are awareness among policy makers with regards to e-government

adoption and implementation. They launched a project campaign which called “Syrian ICT Standards” to overcome obstacles and challenges to cope with the latest updates in ICT. This campaign aiming to raise the awareness among the public-sector staff by the importance of policies and regulations in implementing and adopting e-government services through well-trained experts in this field (Alsaeed et al. 2014). Where the importance of the policies have been emphasised recently by Olumoye and Govender (2018), in countries which suffer from instability and chaotic environment (Olumoye and Govender 2018).

E-government services could be adopted and implemented using mobile channels especially in the geographical-distanced countries with remote areas which found to be a successful approach in countries like India (Sharma and Mishra 2017). As Libya is a wide country where citizens lack public services. Hence, e-government implementation is a necessity which is imposed by several factors including environmental, political instability, infrastructural, and citizens' safety.

Although the above mentioned initiatives are in semi-similar environment, and the methodology used are the same in terms of data collections and analysis procedures, but with regards to the environment in the state of Libya, these factors affecting the three mentioned countries are all present. Libya as described earlier suffer from all the cases described in these countries and despite the fact that there is a chance and initiatives of e-services implementation.

2.6 *E-Government implementation success factors*

Wood-Harper et al. (2004) anticipated that the success factors for e-government adoption and implementation are as follow (people, processes and systems):

- **People** – focuses on how their willingness, skills, knowledge and awareness increased in the context of electronic services.
- **Processes** – relates to how the processes confirmed accountability, transparency and trust among people and government agencies.
- **Systems** – relates to how to ensure the accessibility, security and reliability of the portals and backbone systems (Wood-Harper et al. 2004).

Irani et al. argued that it is essential to build a plan by identifying what is required from the infrastructure and to establish targets and a long-term plan for training and staff development to overcome any constraints and difficulties in subsequent stages (Irani et al. 2007). DeLone and McLean (2003) reported different findings and argued that the quality of information, systems and services was determined by citizens' adoption intention and the level of citizens' satisfaction achieved, and that these factors impact on the successful implementation of any information system.

According to Al-Fakhiri et al. (2008), who focused on different factors related to culture, social and human aspects concerning the successful implementation of e-government, the internet should be utilised to enable a wide range of public users to gain access to the public libraries. They added that the aim was to

engage citizens in the process from the beginning, and bridge the digital divide, by announcing information workshops and regular participants' meetings. Furthermore, they recommended focusing on human-computer interaction by making government portals more attractive, effective and efficient by using precise language, enabling easy navigation, planning for continuous staff development and ensuring its availability to all.

On the other hand, Heeks (2002) argued from the management perspective that the risk of the failure of any system is reduced if the gap between the real world and the design process is identified in a proper way and in advance. He also recommended the following seven approaches to analyse e-government systems:

1. Information
2. Technology
3. The process
4. Aims, objectives and values
5. Employment and available skills
6. Management systems and structures
7. Resources, such as time and finance

Technical and informational infrastructure, management, and financial resources are required in the implementation process of any e-government projects. The culture, social, and human factors proposed to be important as well and could be utilised to implement and use the e-government services. They have the potential to reduce the digital divide among the societies during all conditions and especially in the unstable environment.

2.6.1 What is CSFs?

Critical Success Factors (CSFs) were revealed and made famous by Rockart (1979). He gave the first definition of CSFs as those main vital areas which give likely outcomes and confirm a competitive performance to ensure its success. He added that CSFs differ from one organisation to another and, at the same time, vary from one leader or manager to another.

Boynton and Zmud (1984) defined CSFs as those functional aspects which surround and go in parallel with any project during implementation and offer the required support with continual monitoring to achieve success for any organisation. Several authors have worked with classifying the CSFs for e-government implementation and any other related processes.

Heeks (2005) claimed that the diffusion of E-Government and the key factors that influenced this diffusion varied from one country to another. The United Nations reports showed this variation in the diffusion among the countries and regions and proved Heeks' claim (United Nations 2014).

Al-Mamari (2013) called CSFs the motivating factors, and added that the geographical nature of a country could be considered as a motivating factor for government to establish e-government to ensure delivering services to citizens who live in remote areas. Roland et al.'s (2015) study of the influential factors of e-government implementation within Saudi Arabia identified the following success factors: Religion, Family Ties, Age Structure, Distribution Pattern of Population, and Tribal Heritage.

2.6.2 The critical success factors in the literature

Most of the CSFs found in the literature are listed in table 2-1 below and defined in the next section in table 2-2.

Table 2-1: Critical Success Factors of E-Government implementation

Success Factor	Raised by Authors
1. Strategy	(Gil-García and Pardo 2005; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Franke et al. 2015)
2. Vision	(Gichoya 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Irani et al. 2007; Weerakkody et al. 2011)
3. Structure of Organisation	(Gil-García and Pardo 2005; Altameem et al. 2006; Rose and Grant 2010; Irani et al. 2007; Weerakkody et al. 2011)
4. Relative Advances	(Gichoya 2005; Gil-García and Pardo 2005; Altameem et al. 2006; Irani et al. 2007)

5. Security	(Rose and Grant 2010; Altameem et al. 2006; Torres et al. 2005; Irani et al. 2007; Weerakkody et al. 2011)
6. Staff Development and Training	(Gichoya 2005; Altameem et al. 2006; Gil-García and Pardo 2005; Torres et al. 2005; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011)
7. Organisational Culture	(Gichoya 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Irani et al. 2007; Al-Mamari et al. 2013; Weerakkody et al. 2011)
8. Change Management	(Gichoya 2005; Altameem et al. 2006; Torres et al. 2005; Rose and Grant 2010; Irani et al. 2007)
9. Reward System	(Gichoya 2005; Gil-García and Pardo 2005; Altameem et al. 2006; Rose and Grant 2010; Irani et al. 2007)
10. Top Management Support	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011)
11. Funding	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Becker Jörg et al. 2004)
12. Citizen Centric	(Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007)
13. Supportive Policies & Legalisation	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al.

	2007; Al-Mamari et al. 2013; Weerakkody et al. 2011; Rahman et al. 2014)
14. Geographical Nature	(Al-Mamari et al. 2013)
15. ICT Standards	(Weerakkody et al. 2011)
16. User and Stakeholder Involvement	(Reddick and Anthopoulos 2014a)
17. Good Planning	(Baguma and Lubega 2013)
18. Good System Usability	(Torres et al. 2005; Altameem et al. 2006; Rose & Grant 2010; Kodukula 2011; Irani et al. 2007)
19. Strong Leadership	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011)
20. Good Coordination Between All Project Participants	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
21. Best Practice Consideration	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
22. Make Better Business Process	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)

23. Political Support and Stability	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
24. Good Outsourcing Strategy	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
25. Supportive ICT Infrastructure/Service Availability	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
26. User/Citizen Computer/Internet Literacy	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
27. International Support	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
28. Quality	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)

29. National Information Infrastructure	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
30. Good Partnership with Other Institutions	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
31. Collaboration	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
32. Implementation	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
33. Deal with Bureaucracy	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
34. Citizen Relationship Management	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)

35. Support Interoperability	(Ray et al. 2011; Irani et al. 2007)
36. Technical Staff	(Torres et al. 2005; Altameem et al. 2006; Rose & Grant 2010; Kodukula 2011; Irani et al. 2007)
37. Good Information Quality	(Khayun and Ractham 2011; Hussein et al. 2007)
38. Good System Quality	(Khayun and Ractham 2011; Hussein et al. 2007)
39. Trust	(Khayun and Ractham 2011; Hussein et al. 2007)
40. Age Structure	(Franke et al. 2015)
41. Education	(Franke et al. 2015; Rahman et al. 2014)
42. Distribution Pattern of Population	(Franke et al. 2015)
43. Family Ties	(Franke et al. 2015)
44. Religion	(Franke et al. 2015)
45. Attitudes Towards Technology	(Franke et al. 2015)
46. Tribal Heritage	(Franke et al. 2015)
47. Awareness	(Papazafeiropoulou et al. 2002; Altameem et al. 2006; Franke et al. 2015)
48. Business Process Reengineering (BPR)	(Hussein et al. 2014; Yin 2000; Altameem et al. 2006).

These factors have been agreed upon by many researchers in the area of ICT-related projects, especially those involving e-government implementation. Those factors were found to be within studies in a stable environment.

2.6.3 Definition of each critical success factor

The contribution of this study is formulating a definition of each critical success factor has been formulated to increase the benefits for all disciplines and areas of research. It also proposes a unified approach of their use. The previous table 2.1 consists of authors who considered those factors as critical success factors, but which are not necessarily defined by them in the corresponding literature. Table 2-1 below consists of the definitions of each critical success factor together with the corresponding scholars within the context of ‘e-government’ and ‘information technology’. These definitions are summarised in the following table 2-2:

Table 2-2: Definition of Each Critical Success Factor

Critical Success Factor	Definition
1. Vision	It is the roadmap that any government can follow to achieve the goals that have been drawn up and objectives set within a period. These goals and objectives become the focal point for all government agencies and departments, who can work together through the implementation process (Burn and Robins 2003; Altameem et al. 2006).
2. Strategy	Any project within a company, an organisation or even a country needs to set a specific plan or strategy to motivate and encourage all of the bodies involved toward achievement of the targeted goals (Burn and Robins 2003; Altameem et al. 2006).
3. Funding	According to Heeks (2001) and Ho (2002), funding is considered to be the primary obstacle confronting e-government implementation worldwide. Most of the developing countries suffer from lack of funding, which can hinder the adoption and implementation.
4. Citizen-centric	Tsohou et al. (2013) considered that citizen satisfaction is the key performance indicator for e-government implementation. Hence, e-services should put citizens at the central point (Tsohou et al. 2013).
5. Top Management Support	This refers to the continuous support of higher management for the adoption and implementation process. Senior management must keep the momentum of the processes at the highest level (Al-Omari and Al-Omari 2006).
6. ICT Infrastructure	This indicates the level of readiness regarding ICT infrastructure to allow the development of the e-government portals, as the latter depends mainly on the proper existence of this infrastructure (Zhao et al. 2014).
7. ICT Standards	Research has found that because government accessibility is expected to be made available to all citizens, organisations and government agencies through an integrated gateway, ICT standards are important to avoid any software or hardware incompatibilities (Layne and Lee 2001; Weerakkody et al. 2011).
8. National Information Infrastructure	It is the highway of the national information related to all the country's institutions and agencies. This information is formulated as a national database of related information (Yanzhao 2009; McLaughlin & Glenn 1995)

9. Collaboration	Citizens all over the world consistently place a low level of trust in their governments. However, social media applications, as an example, have created a new type of collaboration and communication. Therefore, collaboration can take different shapes and forms (Sandoval-Almazan and Gil-Garcia 2012).
10. Security	The software engineering incorporated in all e-government applications and transactions must have within it the required policies and regulations. These regulations include, but are not limited to privacy, intellectual property and data protection (Wangwe et al. 2012)
11. Relative Advancement	This relates to the extent to which the new techniques or the innovations are considered to better than those before (AL-Shehry et al. 2006)
12. Citizen Relationship Management	Citizen relationship management is similar to the marketing strategy which places emphasis on the relationship called market–product. The main idea of citizen relationship management is to focus on the following four-step strategy: designing, serving and protecting citizens (Kannabiran et al. 2005). This is a citizen-focused strategy, which utilises technology to create the optimum relationship with citizens by including their opinions and encouraging their participation (Schellong Alexander 2007)
13. Policy and Legal Issues	Weerakkody (2011) theorised that e-government innovation changed the perspectives of how policymakers see the businesses, organisations and government agencies, on one hand, and their relations with citizens and data, on the other hand. Therefore, the demand for regulations regarding privacy, data protection, crime and hacking has increased in order to organise and protect all elements (Weerakkody et al. 2011; Altameem et al. 2006).
14. Quality	This focuses on the continuous improvement to the services delivered, and the way in which these services reach and are delivered to the public (Weerakkody et al. 2011; Altameem et al. 2006)
15. Reward System	The reward system is a type of staff motivation to improve the quality of their work to reflect positively on the outcome. Simultaneously, this system should also consider and include punishment in parallel to reward (Heeks 1999; Altameem et al. 2006).

16. Implementation	This merely means turning the government's resolutions and planned work on paper to real work on site (Altameem et al. 2006).
17. Training	This is necessary to transfer knowledge and skills to a large group of people, and even to accommodate them in the design and implementation phases for training purposes from different geographical areas. Thus, knowledge is easily transferred to a more substantial number of citizens (Heeks 2006; Heeks 1999)**.**
18. Organisation Structure	Behind the success of any successful e-government project there is a robust organisational structure. It is as simple as a hierarchical diagram which illustrates the jobs, job descriptions, titles and specifications of the holders of the positions (Heeks 2006)**.**
19. Technical Staff	Technical staff is a group of technically professional people who are individually responsible for the development of the components of the system (Heeks 2006)**.**
20. Change Management	Change management is purely the systematic organisational processes which are responsible for the organisation's transition period from one state to another targeted state, based on the organisational vision and strategy. It is widely considered as a critical success factor for any development (Nograšek 2012; Altameem et al. 2006)**.**
21. Business Process Reengineering (BPR)	Yin (2010) defined BPR as "The procedures which are created and strictly followed to utilise the potentials of any organisation up to the maximum" (Hussein et al. 2014; Yin 2000; Altameem et al. 2006)**.**
22. Organisational Culture	Culture comprises the ordinary collection of principles, values and traditions that are found within any organisation's staff (Schein H. Edgar 2010).
23. Awareness	Awareness relates to the process of communicating E-Government to the citizens, agencies and all related stakeholders to create an understanding of its meanings and realise its benefits and advantages (Papazafeiropoulou et al. 2002; Altameem et al. 2006)**.**
24. Support Interoperability	Interoperability means that when a user or citizen wishes to access a specific public service he does not need to apply or ask for that service in many places. There should be one point of contact regardless of what office will be responsible

	for that service. Interoperability tackles and prevents the heterogeneity of data within the government institutions and supports the integration of information and services (Ray et al. 2011).
25. Dealing with Bureaucracy	Reducing reliance on people behind desks is necessary. Therefore, accessing e-government portals and internet usage by all at any time is a fundamental requirement (Willoughby et al. 2010).
26. Good Partnerships with Other Government Institutions	As a result of e-government integration, portals will enable this type of partnership, and an excellent partnership will provide functional connectivity and maturity (Dwivedi et al. 2011).
27. User and Stakeholder Involvement	In order to widen the meaning, the words user and stakeholder will be substituted with by the word citizens. E-government is a collection of application portals which deal with all services related directly or indirectly to citizens. Therefore, citizens' involvement is the core success factor for e-government implementation (Linders 2012; Reddick and Anthopoulos 2014b).
28. Good Planning	Planning encompasses the way the development is encouraged to be sustainable and promoted to achieve the e-government aims and objectives (Alexander 2009).
29. Good System Usability	This relates to the effectiveness and efficiency of the e-government portals to be used by all users regardless of their domain knowledge, without any difficulties (Friedman-Berg et al. 2009).
30. Strong Leadership	Leadership is connected to the political framework, and specifically the commitment level of the highest rank of government leaders towards e-government projects (Weerakkody et al. 2011). Strong leaders are needed for an e-government implementation process, who can create a vision with an appropriate strategy to achieve it, together with identify the right things to do and resolve any issues (Streib and Navarro 2008).
31. Good Coordination Among Project Participants	This is the process of exchanging information between the project members, government agencies and departments to ensure transparency and enable knowledge partnership among all participants (Estevez et al. 2007).
32. Best Practices Consideration	It is necessary to see what methods others have previously applied successfully to speed up achieving their goals. It is a regular activity, which is widespread and accepted worldwide (Undheim 2008).

33. Political Support and Stability	Political support is analogous to instruments which are used by local government and e-government initiators to motivate them to adopt and implement E-Government initiatives for the sake of citizens' satisfaction (Ahn and Bretschneider 2011).
34. Good Outsourcing Strategy	The process of substitution in the event of a lack in either hardware, software or IT experiences within the organisation or government institutions is important, especially in the developing and least-developed countries, because of the deficiencies of those sources (Heeks et al. 2001; Heeks and Arun 2010; Chen et al. 2012).
35. User/Citizen Computer/Internet Literacy	The ability of the users or citizens to use computers and access the internet. Sometimes this factor is considered under the heading of 'digital divide' or 'awareness', but the definition here is specific to the abilities (Sipior et al. 2013).
36. International Support	This relates to all types of international support, ranging from opening investment opportunities in a developed country to investing in the communication sector, which will lead to the growth of internet access and mobile technology usage (Khan et al. 2012; Brown and Thompson 2011).
37. Age Structure	This is the percentage of age distributions among the population. For example, in Arab countries almost 60% of the population are under 30 years old (Youth-Policy-Press 2016; Franke et al. 2015).
38. Education	The level of knowledge of the available technology and general knowledge of each citizen (Franke et al. 2015).
39. Distribution Pattern of Population	This is the population density in a specific country and the location of concentrations of that population within the geographical map of that country in order to associate public services in an equal manner (Prieto et al. 2014).
40. Family Ties	Family ties are more comprehensive than the relationships within one household; for example, father, mother and children. It includes all degrees of relatives of both family members, and furthermore, the neighbourhood, religious group, and even colleagues in schools, jobs and business (Cengiz et al. 2015).
41. Religion	Religion plays a vital role in conservative societies and should be considered as a vital factor in any change to how citizens will deal with technology (Cengiz et al. 2015; Franke et al. 2015).
42. Trust	Trust can be defined from different perspectives. Kim and Tadisina (2007) collected various views about trust; however, in general trust usually exists between two parties, the trustor, who is worthy of the trust and confidence, and the trustee,

	the target for the trust. Therefore, in the case of e-government portals, the trustor is the online services, e-services, technology and websites; the trustee is the citizens (Euijin and Tadisina 2007).
43. Attitudes Towards Technology	These can be defined only as the individual level of adoption, awareness, education, willingness and usage of new technology. It is the social concept of the relationship between the individuals and the ICT (Mitcham 1994).
44. Tribal Heritage	This is related to the cultural aspect of the population and its relationship with a country or countries. The African and Asian population are famous for this social structure, which is a form of family, ethnic groups or minorities who live in a country or several countries. Usually, the tribe is socially and politically related to the tribe leader (Bwalya et al. 2014).
45. Geographical Nature	The geographical nature of any country is different to others. For example, a comparison of Qatar with Libya or Australia and the United Kingdom shows that they are entirely incomparable. Therefore, it is a critical factor on which to focus, as it is difficult for a government agency to deal with people in vast areas on a one-to-one daily basis (Willoughby et al. 2010; Al-Mamari et al. 2013).
46. Good Information Quality	This is the standard of the content of any services, goods or information that encourages citizens or customers to use or buy that type of quality service (Lopes and Galletta 2006)
47. Good System Quality	This relates to the level of permissions that are given by the system portals to citizens for them to obtain the services they need with high quality, flexibility, within the expected time and smoothness (Liang et al. 2011).
48. Good Service Quality	This is the extent to which the services provided meet the client's, citizen's or customer's expectations (Liang et al. 2011)

As it has mentioned by Karlsson et al. (2017) that the critical success factors mentioned above are not static, as they keep changing over the time (Karlsson et al. 2017). Therefore, there is a possibility of new factors emerged based on the environmental issues and circumstances.

2.7 ***Research gap***

Technology and politics can drive government institutions to utilise information communication technology to the optimum, in order to thoroughly communicate for better service delivery (Bertot et al. 2010). Despite the notion that ICT can create openness and transparency, the culture and atmosphere within government is still vague. The initial findings showed that an atmosphere of openness could be created by utilising ICT to reduce corruptive behaviour (Bertot et al. 2010). Based on these researchers' views, the impact of ICT implementation by developing e-government can be categorised into the following benefits:

- Public sector transparency enhancement: making information available to the public will lead to better service delivery, and it is the key to effective and efficient governance (Bertot et al. 2010).

- Enhancing policy making: citizen participation and social consciousness are two critical benefits of e-government. New techniques for online community engagement and additional avenues

have been made available for consultation and interaction with citizens collaboratively and creatively, because of the popularity and evolution of ICT. This medium will have a positive impact on citizen-to-government, government-to-citizen, and citizen-to-citizen dialogue, which will lead to increasing interest in politics and citizen participation, and create identity and trust (Dixon 2010).

- Enhancing public services: E-Government creates a more innovative mechanism in this context. Osimo (2008) posited that electronic services can improve public services delivery in the same way as commercial companies by sharing the product design with their potential customers.

In relation to social networks and the possibility of e-government adoption and utilisation, Bertot et al. (2010) stated that "the social technologies available today are transformative in general and about transparency and anti-corruption. Though there are challenges and barriers to implementation, and it is possible to overcome those challenges" (Bertot et al. 2010, p.6). In addition, Medina and Rufín (2014) argued that the critical outcome resulted from both trust and transparency in any research is the satisfaction factor.

In conclusion, the absence of government initiatives and the private sector's role in Libya for four decades has generated an absence of creative spirit among citizens and government agencies. Furthermore, the attempts made

by several government institutions over the last ten years to initiate some e-government portals by introducing ‘E-Libya’ and ‘Libya Gate’ were fruitless. However, these were specific institutional initiatives which have not persevered due to the lack of proper strategic plans (NID 2015; General Information Authority 2014; Ministry of Communications and Information 2012).

Moreover, the current chaotic situation has cast a shadow over all aspects of life, particularly those which affect citizens in their daily lives, not to mention the government’s plans and strategies in the long run. This research investigated the feasibility of E-Government implementation in this kind of unstable environment by exploring the success factors of one of the e-projects in the state of Libya. Libya was considered as a case study because successful but limited efforts have been made in this situation, which are worthy of further study.

As highlighted in the findings mentioned above, the next steps of this research are as follows: firstly, to explore the e-passport project success factors to design a framework for other e-projects. Secondly, to quantitatively investigate citizens’ opinions about e-passport usage and e-services in general. This will provide indications for citizens’ participation levels and trust of e-services during this process. This will be combined with the government perspectives for a more solid outcome.

These four steps will identify different factors that affect the progress of e-passports and could be utilised to start other e-projects with fewer barriers. From these studies, it will be possible to design a framework that can be followed for designing and implementing other e-services projects within chaotic environments.

2.8 ***Summary***

This chapter creates a theoretical background for the entire research. It provides the reader with the necessary background about the e-government topic and the history of its adoption and implementation for the last two decades. The chapter highlights the role of e-government; it's transparency and accountability issues related to government institutions and also its role in fighting corruption. The impact of chaos on spreading corruption among institutions and citizens. The success factors of e-government implementation are collected from different perspectives and then utilised to create the theoretical framework for a proposed improved implementation. Prepare the bases to establish a discussion background for the next chapters.

Chapter 3: **Research Methodology**

3.1 ***Introduction***

This chapter tackles some viewpoints appropriate to the study of e-government implementation. It provides readers with contextual material about the research philosophies and introduces the related methodologies through explaining the following points. Firstly, it briefly defines and introduces the research philosophies, methodologies and the related approaches and methods. Secondly, it focuses on the proposed methodology followed by the researcher during all research stages. Thirdly, the qualitative and quantitative research methods are discussed in more detail, with a focus on their strengths as well as weaknesses. Finally, the qualitative method is elucidated and the question of why this is typically an ideal method to use in this context, compared with the quantitative analysis method, is addressed.

3.2 ***What is a research methodology?***

Crotty (1998), defined the research methodology as “the strategy, plan of action, process design lying behind the choice and use of particular methods and linking that use of methods to the anticipated outcomes” (Crotty 1998, p.3). Wilson Ng (2014) defined the research methodology as a specific

research pathway that the researcher follows during the research journey to seek the answers and solutions of his/her research questions.

The aim of the research method in this study, and at any stage, is to show how the researcher conducted the study and what methods he/she followed during the primary data collection, the manipulation processes and whilst examining the related data (Wilson Ng 2014). This is undertaken without losing the plan for the final goal, and in order to make a proposal for decision-makers and the relevant stakeholders of the study. Due to the shortages in the experimental studies in this context and the lack of sufficient resources, a fact-finding experiment in the form of exploratory research was conducted to explore the current situation (Wilson Ng 2014).

3.3 ***Research philosophy***

Saunders et al. (2009), defined research philosophy as “the development of knowledge and the nature of knowledge”. From that definition, it can be noticed that the primary objectives of the research philosophy are to form an understanding of the critical philosophical concepts of the data collection methods and analysis. That knowledge supports the research methodologies as well as the data collection methods (Quinlan 2011). Other authors have said that the research methodology is all about the research stance, which means how the researcher perceives and understands the nature of the world around him/her (Wilson Ng 2014). He added that there is a variety of research

stances available to researchers and they must choose which stance is suitable for their particular study (Wilson Ng 2014). With regard to the research on information systems, there are three conventional philosophical paradigms which are usually followed and used by researchers. These philosophies are Positivism, Interpretivism and Realism (Saunders et al. 2009; Klein and Myers 1999). Nevertheless, there is no one particular philosophy that is superior compared with the others. Choosing one philosophy depends on the nature of the study and the way the researcher perceives the surrounding world (Saunders et al. 2009; Lee 1991). These philosophies are explained in Figure 3-1. This research followed the first two philosophies which are briefly explained in the next sections.

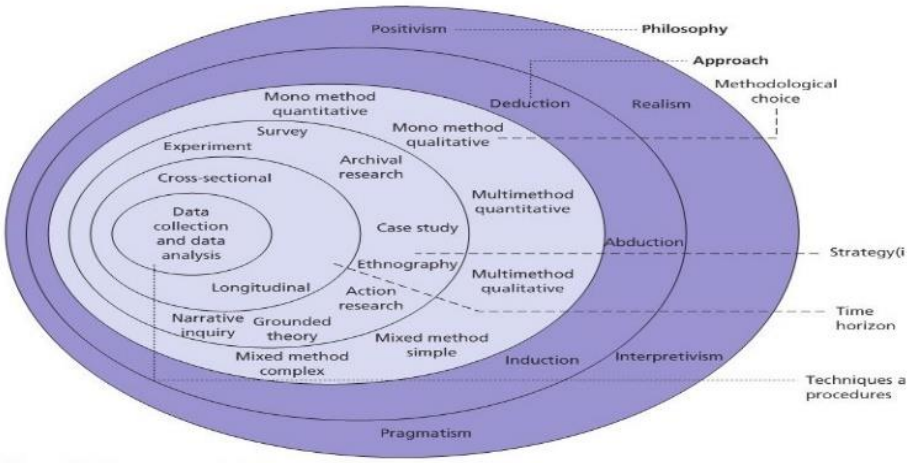

Figure 3-1: Research 'Onion' (Saunders et al. 2009).

3.3.1 Positivism

This term was first introduced at the beginning of the nineteenth century by Auguste Compte and Emile Littre, scholars in the social sciences (Johan Heilbron 2009). Compte said that the observer or the researcher should conduct any study independently. He added that all study choices must also be grounded on the aims and objectives of the research, not the interest or beliefs of the researcher (Mark Easterby-Smith, Richard Thorpe 2013). Positivism aims to evaluate and test theories in order to increase the perception and understanding of the case under study (Lee 1991).

Other researchers have categorised the study of information systems to be in the positivism research area, provided there are measurements that can be assessed in the form of variables, assumptions and schemes, to identify the implications as findings (R. Burke Johnson and Anthony J. Onwuegbuzie 2004). Philosophers in the field of science have criticised this stance, as it enforces boundaries and limitations on the outcome of the research and may disregard other important and relevant findings (Collis and Hussey 2014). Others have argued that based on an ideology which said that the reality is absolute and is also independent of the watcher or the observer, positivism is considered to be a research strategy or an approach that can be used to tackle any research areas (Aliyu et al. 2014).

3.3.2 Interpretivism

Walsham (1995), found that this type of study was mainly used to create a base of understanding of the phenomena that have launched in a specific society. With regard to the study of information systems, this method can be used to develop familiarity with all of the aspects related to the phenomena under study. This type of method requires going thoroughly and deeply into all the elements of this phenomenon. He also added that because social reality, in general, is subjective and socially constructed, there are a variety of realities and each person has his/her perception and interpretation of that phenomenon (Walsham 1995).

Interpretivism can be considered as a typical philosophical paradigm, which came after the positivism paradigm to fill and cover the gap left behind by the other pragmatic social science methods (Lee 1991). According to Lee (1991) and Walsham (1995), this stance is used to investigate the participants' views, opinions and attitudes towards the issue of the study, which forms an understanding of the surrounding world. This understanding can be utilised to interpret the scene and create themes that can be taken forward to pursue more empirical studies using the available source of data. The interpretivist approach is also suitable for the cases where there have been no previous empirical studies or where those that have been undertaken are insufficient (Yanow and Schwartz-Shea 2005).

Lin (1991) said that because social reality is a compound phenomenon and can easily be affected if it is approached or explored, interpretivism stands on the assumptions or hypothesis (Lin 1998). Interpretive research emphasises the interaction of the individual with the outside world and adds its understanding and interpretation to the phenomenon that is studied. Individuals in interpretive research are assumed to be originators, who are associated with interpreting the surrounding social world and are the cause of shaping and constructing the knowledge that occurs in a phenomenon, through the meaning that is captured by people who are involved in that phenomenon (Lee 1991; Klein and Myers 1999). Thus, interpretive research about information systems aims to produce an in-depth clarification of the phenomenon, to simplify the understanding of the situation and provide comprehensive elucidation of its impacts (Klein & Myers 1999).

Walsham (1995, 2006) described how interpretive research in information systems is carried out. One stage of this research falls into an interpretive paradigm. This includes choosing a style for investigating a subject of interest, such as formal interviews, preparations for gaining access and collection of fieldwork information, such as notes. This is followed by utilising an appropriate theory or framework for designing the interpretive research for data collection and analysis and conducting interpretive research about displaying the interpretation of the case study from the researcher's

understanding and interpretation of the participants' perspectives (Walsham 1995, 2006).

3.3.3 Interpretivism vs positivism

Saunders and colleagues (2009), designed the research 'onion'. This states that the adoption of any research approach or philosophy mainly depends on how the researchers view, perceive and understand the surrounding world. This understanding will support the strategy and the plan which is followed and adopted by the researchers.

Based on the concept of the 'research onion', the research philosophy which can be adopted is defined according to the way that the world is viewed and understood. This assumption will support the research strategy and the methods to be chosen as a part of that strategy (Saunders et al. 2009). Both positivism and interpretivism can be followed in proposed research, as there is no single approach that is the best (Loraine Blaxter, Christina Hughes 2011). The two methods complement each other, and each one fills the gaps of the other to widen the research process and gain more factual and generalisable findings (Saunders et al. 2009; Loraine Blaxter, Christina Hughes 2011; Crotty 1998).

Robson (2002) and other scholars said that positivism is the most famous and significant approach that is frequently used in management as well as social

sciences research. They added that it could be evaluated and criticised based on the following points:

- Positivism is a single technique and, in all circumstances, cannot utilise and use scientific knowledge.
- The perceived knowledge is usually affected by the aims and objectives of the managers.
- The generalisation process of the findings needs a right size of the study sample (Easterby-Smith et al. 2013; Robson 2002).

In contrast, interpretivism focuses on the fact that 'human construction' can be studied and understood only in a subjective way (Jan H. Kroeze 2012). That is because the researcher cannot exclude himself/herself from the 'social reality' in which he/she lives. Interpretive studies try to understand the actual multiple worlds, where each has different perspectives on the values, meanings and the interpretation of the situation that is currently under study (Jan H. Kroeze 2012). Other scholars have said that interpretivists claim individuals are not just puppets who react to external social forces, as positivists believe. However, they are intricate and complex, and different people experience and understand the same 'objective reality' in very different ways and have their own, often very different, reasons for acting in the world (Blaxter & Hughes 2011). They argued that to understand human actions, researchers need to see the world through the eyes of the actors who are

doing the acting. This approach would be much more of a qualitative one, which uses methods such as unstructured interviews or participant observation (Crotty 1998; Blaxter & Hughes 2011).

3.3.4 Strengths and weaknesses

Each approach has its own specific features and based on these the researchers choose those suitable for their studies. Hence, the study type and the nature of the environment helps the researchers to select the most appropriate method or technique for their project. In Table 3-1, which has been adapted from Easterby-Smith and Thorpe (2013), the strengths and weaknesses of the positivist and interpretivist approaches are illustrated:

Table 3-1: Positivism and Interpretivism Strengths and Weaknesses (Easterby-Smith & Thorpe 2013)

	Strengths	Weaknesses
Positivist approach	• Can include broader areas • Economic and relatively fast • It is absolute and truthful • Easier to provide justified policies	• Strict and non-natural • Not suitable for process, meanings or producing theories. • It is difficult to realise any actions or consequences
Interpretivist approach	• Suitable for processes and meanings • Appropriate for generating theories	• Consumes a lot of time and effort in data collection and analysis

	• Data gathered is natural • Flexible in making assumptions and hypothesis	• Interpretation process is comparatively hard • Decision-makers do not entirely rely on its results

To sum up, the primary aim of this research was to try to identify the opportunities which impact on the E-Government implementation process. In addition, it investigated the feasibility of adopting and implementing this innovation in the current situation, based on the findings that were expected to emerge from the study of the currently implemented project. It was selected because of the following reasons:

1. It offers real and natural primary data collection.

2. Regarding the extraction of themes and building assumptions, it is suitable for theory generation.

3. The expected results of this research were achieved through statements analysis.

Since an e-government initiative and its implementation is mainly related to formal institutional settings and social norms, it is essential to note that these bring about a sophisticated network that consists of both formal and informal elements (Helmke and Levitsky 2004). That is one of the reasons why initially the interpretive approach is useful to gain a thorough understanding of the research phenomenon (Walsham 1995). Hence, the interpretivist approach

was considered as the best suitable approach for the first two qualitative studies conducted. Moreover, the interpretivist approach could help a researcher to utilise several methods and approaches to investigate and describe the surrounding social world (Van Maanen 1983). With the inductive process, interpretivism allows the findings and individual instances used to be generalised.

Walsham claimed that interviews are one of the leading sources of primary data gathering tools because the researcher can immediately access the interpretations concerning the actions, events, attitudes, views and aspirations of the contributors. Regardless of the interview style, they enable the researcher to focus, examine and deeply understand the interpretation of the participants in more detail (Walsham 1995).

3.4 *Research methods*

3.4.1 Quantitative vs qualitative

The literature review and the research method techniques described earlier were combined with the illustrated research philosophies and followed to collect primary data. The methods can be classified into two main techniques: quantitative and qualitative research methods. Each of these two techniques usually follows a different school of thinking or philosophy (Ittner 2013). According to the previous literature, for the process of primary data generation,

those following a positivist approach usually use the quantitative method, while interpretivists follow qualitative methods.

Quantitative research is a mode of inquiry often used when the goal is to test theories or hypotheses, collect descriptive information or test relationships among variables. These variables are measured and yield numeric data that statistically analysed. Quantitative data have the potential to offer measurable evidence and help to establish causes and effects to obtain efficient data collection procedures. It creates the possibility of replication and generalisation to a population, to facilitate the comparison of groups, and to provide insight into a breadth of experiences (Meissner et al. 2011; Creswell and Plano Clark 2011).

Mixed-methods research is when the researcher uses quantitative and qualitative research methods in the process of their study, data collection and analysis. It can be argued that by combining both types of research, the limitations of each method can be counterbalanced and the gaps of data can be predicted (Meissner et al. 2011; Creswell and Plano Clark 2011). For that reason, the mixed-method approach was used in this research context, both in-depth interviews and surveys (Meissner et al. 2011; Creswell and Plano Clark 2011). The intent of researchers using a qualitative approach is usually to gather information from the individual to identify themes, which allows them to develop theories inductively, while research using a quantitative approach

intends to test theories deductively searching for evidence to either support or refute the hypothesis (Creswell and Plano Clark 2011).

3.4.2 Qualitative method and positivist approach

According to Ittner (2013), the qualitative approach is naturally considered as being more subjective concerning its features. It also uses analytical views to obtain the knowledge which is required for human and public actions (Ittner 2013). It is a systematic form of investigation that uses different methods of data gathering such as in-depth interviews, observation and review of documents (Ittner 2013). Qualitative data helps researchers to fully understand processes, particularly those that appear over time, provide detailed information about the situation under study, and emphasise the voices of participants through quotes. Qualitative methods facilitate data collection when measurements do not exist and provide an in-depth understanding of the concepts under investigation (Meissner et al. 2011; Creswell and Plano Clark 2011).

In this research the qualitative method is used to collect and explore the phenomena to build up a strong base by investigating the government and citizens perspectives. Then, the quantitative approach is used to test those emerged factors from the two perspectives by using a different approach to create the diversity in the primary data sources and collection methods.

The questionnaire survey was also used to back-up the interviews, to develop improved data analysis – thus, it was not purely qualitative, but also involved a quantitative approach. The adoption of compound methods allows for combining of qualitative and quantitative methods, by using a questionnaire to collect data. The main reasons for selecting the qualitative method as a primary approach is illustrated below:

- The topic of G-2-C adoption and implementation in developing countries, particularly in the situations of conflict and chaos, empirically, is a unique research idea. Therefore, the approach and methods illustrated above are suitable for this type of study, as there is no data in existence that can be utilised, and the research can only be accomplished by profoundly investigating and exploring the situation in real life.

- Based on the principles of the inductive approach, a theory can be generated, or an intended framework designed and developed which could be generalised within the context of the Libyan case.

- Based on Collis and Hussey (2014), the selected approach was to focus on the patterns, ideas and themes to raise hypothesis, rather than test assumptions and theories. Hence, the idea behind this research was to seek the critical success factors and evaluate them to create the potential to develop a strategy in the form of a framework or a model

for successful implementation of E-Government in the state of Libya (Jill Collis & Roger Hussey 2014).

Using the above reasons, and facts which were extracted from the literature review, the researcher was confident in using the qualitative and quantitative as mixed methods was an appropriate approach to conduct the research. This enabled the set objectives to be achieved, despite the limitation of time.

3.4.3 Thematic Analysis

Thematic analysis is a method where the researcher is in-depth analyse the qualitative data using the coding and pattern matching process which apply on the collected qualitative data. This method is easy to use and relatively nuanced (Garner and Ragland 2015; Boyatzis Richard E. 1998; Braun and Clarke 2006). It is similar to the content analysis (Wilkinson 2000) where it directly depends on the researcher's understanding and interpretation.

The thematic analysis flexibility and accessibility have attracted the researcher to use it in this research study. In addition, its ability to summarise the main features for the large amount of data (Braun and Clarke 2006). The data sample was suitable to use this approach which was simple and limited number of participants.

3.5 ***Data collection***

Based on studies conducted by Kauzel (1999) and Marshall et al. (2013), the primary data collection for an exploratory pilot study can be limited to the minimum of six participants (Creswell 2007; Morse 2015; Anton J Kuzel 1999; Guest et al. 2006). The data is collected using the qualitative method to explore the new findings and themes which can build up the theory (Adolph et al. 2011; Khan 2014). This approach was used in this study; hence, the process started by conducting semi-structured interviews (Marshall et al. 2013), using convenience sampling and the snowball technique for selecting the most senior and professional persons to avoid direct recruitment from organisations (Adolph et al. 2011; Khan 2014).

There are some methodologist has recommended different ranges at different times but according to Bryan Marshall et al. (2013), together with the principal of data saturation which mentioned by Guest et al. (2006) in their study, they found that data reaches to saturation level after conducting certain number of interviews (Guest et al. 2006). The average ranges found are collected and illustrated in Table 3-2.

Table 3-2: Data saturation levels in Interview method. Adopted from (Marshall et al. 2013)

	Grounded approach Studies	Phenomenological studies

Creswell (2007)	20-30	6
Denzin & Lincolin (1994)	30-50	
Morse (2000)	20-30	6-10
Kauzel (1999)		6-8
Guest, Bunce and Johnson (2006)	12	

3.5.1 Techniques used

3.5.1.1 Face-to-Face interviewing

Face-to-Face interviewing is widely used techniques for primary data collection. It has the potential to conduct comprehensive and in-depth understanding of the phenomena under study by probing for more explanations from the participants. However, the drawbacks of this technique are apparent which related to the cost as it involves traveling and time consuming (Hilgert et al. 2016). Although this study intended to diversify the methods and data collection techniques to give the proper meaning to the data and reach to a solid conclusion, the circumstances prevented the researcher from doing face-to-face interviewing with government officials on the ground.

3.5.1.2 Email interviewing

According to James (2015), if the researcher wants to collect data and build a dialogue with the participants during the data collection process, an email interview is a valuable tool that can be utilised along with other tools. Also, interviewing individuals using electronic mail provides a convenient platform for them to participate in the research. It would be unachievable if they only

relied on one method of data collection, such as face-to-face interviewing (James 2015). It was decided to collect data using different tools, utilising all means of communication to ensure the richness of information and not depend on one method of data collection.

3.5.1.3 Interviewing people that you know

Seidman (2015) argued that when both the interviewer and the interviewee know each other, it is difficult to avoid prior knowledge assumptions by either of them, and this could result in bias or leading answers in detailed directions. In this study, the researcher was unable to choose between the interviewing of strangers and acquaintances (Gummesson 2003), because of the difficulty in contacting individuals in a country as unstable as Libya.

As the situation on the ground was unsafe and there was a lack of direct transport to the state of Libya, the investigation was conducted by using telephone interviews with different government officials and those who are related to the e-government project in Libya. In conforming to the interpretive approach, the primary qualitative data relied heavily on conducting six informal and semi-structured interviews with government officials. In total, 17 citizens were interviewed using different methods. Two of them were interviewed using face-to-face meetings, eight of them using email and the rest were interviewed using the telephone and skype.

3.6 *Quality of empirical research studies*

All empirical research studies, especially social studies, can be examined through a variety of tests to ensure their quality. These tests are a validity test, a reliability test, an internal validity test and an external validity test (Hair et al. 2012). All these tests, which are associated with empirical social research, are briefly introduced in the next section, as they are used in the research analysis and discussion later in this thesis.

3.6.1 Normality Test

The normality test is one of the preliminary tests that the researcher should perform at the beginning of the data analysis process. SPSS 23 includes this test, which shows whether the data is not normally distributed and is skewed. Although the PLS-SEM approach is considered to be a non-parametric method where the data under analysis is not expected to be in a normal distribution shape. It is necessary to test the normality of the data distribution before choosing the analysis method. The importance of this step is to make sure the bootstrapping process will not be affected (J. Hair et al. 2014; Sarstedt et al. 2014). Kolmogorov-Smimove and Shapiro-Wilks are two primary tests which are applied to test for normality in SPSS, where the hypothesis can be accepted or rejected based on the significance values (Pallant 2016; J. Hair et al. 2014). On the other hand, the use of both skewness and kurtosis are other approaches for checking the normality of the data (Hair et al. 2014).

3.6.2 Validity

Hair et al. (1998) defined validity as “the extent to which a scale or a set of measures accurately represents the concept of interest” (Hair et al. 1998, p.118). Validity consists of several types, which are mostly accepted in research and are known as convergent validity, discriminant validity, nomological validity, internal validity and external validity. These types are introduced in the following sections.

3.6.3 Convergent validity

It assesses the degree of correlation between two measures in the same concept. Where the correlation is high, in this case, means that it measures what is intended to measure (Hair et al. 1998).

3.6.4 Discriminant validity

It measures the degree of distinction of two conceptually similar items (Hair et al. 1998). Therefore, it deals with the correlation again, but this time with the summated scale together with the similar but conceptually distinct items.

3.6.5 Nomological validity

It measures “the degree that the summated scale makes accuracy prediction of other concepts in a theoretical based model” (Hair et al. 1998, p.118). In this case, the researcher should assess the scale and instruments that he used in previous research or any accepted principle.

3.6.6 Internal validity

Ryan at al. (2002) defined internal validity as the level of control that has been achieved during data collection which can result at the end in a valid conclusion (Ryan et al. 2002; Ihantola and Kihn 2011).

3.6.7 External validity

This test stresses the level of generalisability of the resulting conclusion, which could be affected by environmental validity together with the time and population, to avoid making any mistakes (Ryan et al. 2002; Ihantola and Kihn 2011).

3.6.8 Reliability test

Reliability aims to assess the degree of consistency between multiple items or measurements of the specific construct (Hair et al. 1998, p.117). Cronbach Alpha is the measure widely used to assess the reliability of the instruments. The lower limit of Cronbach Alpha is 0.7, although 0.6 can be used for exploratory studies (Henseler et al. 2014; Hair et al. 2014, 2017).

According to Bryman (2001) and Hair et al. (2014), reliability testing is essential to ensure the consistency of the instruments in the questionnaire. Cronbach's Alpha is mainly applied to test the internal reliability (Joe Hair et al. 2012; Bryman 2015, p.76).

3.7 ***Structural equation modelling***

Structural equation modelling (SEM) emerged as a result of the "evolution of multi-equation modelling developed principally in econometrics and merged with the principles of measurement from psychology and sociology" (Hair et al. 1998, p.584). SEM is a multipurpose tool and multitude of techniques (Nachtigall et al. 2003) which can be used in academic as well as managerial research. It is also utilised in the estimating processes for other models (Hair et al. 1998). This research adopted this technique for several reasons. Firstly, its enormous flexibility. Secondly, it offers several possibilities in undertaking useful, or useless or even harmful things (Nachtigall et al. 2003). Despite some of the drawbacks, still, SEM is the choice for the analysis of any exploratory studies. In addition, it offers the flexibility of building up and changing the model diagrams at any stage of the design phase.

There are several approaches to the conduct of SEM research. The two most famous approaches are Covariance-Based SEM (CB-SEM) and Partial Least Square SEM (PLS-SEM). They are both briefly introduced in the following sections.

3.7.1 CB-SEM

Covariance-based SEM has been widely used in recent years. It is still the most preferred data analysis method among researchers, especially when the data sample is large, normally distributed, and the model is concrete and well

established (Hair et al. 2011, 2017; Vinzi et al. 2010). It is used for testing, comparing or confirming the theory (Joseph Hair et al. 2012, p.144).

3.7.2 PLS-SEM

Vinzi et al. (2010) stated that PLS could be used in research analysis as a soft modelling approach to SEM without prior assumptions for normality (Vinzi et al. 2010; Wong 2013). Compared with CB-SEM, PLS-SEM is a suitable alternative for the following reasons: the sample size is small, the model is correct, and the predictive accuracy is supreme (Wong 2013). Although PLS-SEM has some limitations, it is still considered to be a useful tool for SEM when the data is skewed. This approach was adopted in this thesis because it is well-known, and a tremendous number of researchers used this approach in several publications during 2016 and 2017.

Recently, Dijkstra (2015) and Bentler and Huang (2014) discussed these two methods from a competitive approach, rather than from a comparative approach, and introduced a new approach where PLS-SEM can mimic CB-SEM. They called this the PLS-consistent approach (PLSc) (Bentler and Huang 2014; Dijkstra 2015).

3.7.2.1 SMART-PLS

PLS path modelling was initially developed by Herman Wold in 1982 and 1985 for computational aspects (Wold 1982; Tenenhaus et al. 2005). While Chin

(2008) used it for the software development aspects and validation techniques (Chin et al. 2008; Tenenhaus et al. 2005). In 2017, the Smart-PLS 3.2 was developed, and this version was selected to perform the analysis process for this research (Sarstedt & Ringle 2017).

3.8 ***Data analysis***

Variance-based structural equation modelling of partial least square has been adopted as an approach to conducting this research to analyse the 905 items of quantitative data which were collected from the Libyan citizens. This approach was mainly selected because PLS-SEM can be used as a soft modelling approach regardless of the type of data from the normality perspective (Garson 2016). The characteristics of PLS-SEM encouraged the researcher to adopt it as an analysis tool for this project, because of its exploratory nature and as the data was collected under challenging circumstances and from different places it was not expected to be normally distributed (Hair et al. 2012). PLS-SEM is intended for causal-predictive analysis when the situation is highly complicated, and there is a lack of theoretical information.

PLS-SEM was chosen to be used as an analysis tool for several reasons. Firstly, its ease of use, and ability to handle extensive functionalities. Secondly, it is quite a new tool within SEM and is considered as the second-generation approach compared with multivariate regression. Thirdly, its ability to fit with

the small data sets (Hair et al. 2011, 2017). The following table concludes why the PLS-SEM approach was selected, rather than the CB-SEM approach in this research study.

Table 3-3: Comparison of CB-SEM and PLS-SEM

CB-SEM	PLS-SEM
Confirming or testing a theory, which is appropriate for hard modelling and minimising the co-variance matrix.	Prediction and developing a theory, which is a soft modelling technique.
(Barclay et al. 1995; Sosik et al. 2009; Garson 2016; Sarstedt et al. 2014; Hair et al. 2012)	
It is used as a reflective model only. It is a relatively complex process to handle both reflective and formative models.	Can handle either reflective or formative constructs or even the combination of both of them in one model.
(Sosik et al. 2009; Henseler et al. 2009; Hair et al. 2014)	
Before the analysis process, the following conditions need to be fulfilled: a) normality, b) observation independence, and c) variable metric uniformity. If any of the three conditions do not exist, the result will be highly biased.	It uses the mechanism of calibration. Hence those conditions are not demanded in the PLS-SEM approach.
(Sosik et al. 2009; Henseler et al. 2009; Sarstedt et al. 2014; Joe F. Hair et al. 2011)	

3.9 ***Institutional theory***

In general, institutional theory refers to who provides the ‘rules of the game’ (North 1990), which increases interaction and restructuring within societies. There are several definitions of ‘institutions’. Aoki (2001) pointed that “which definition of an institution to adopt is not an issue of right or wrong, it depends on the purpose of the analysis.”. In this research, which concatenated both management and computer science, there was a focus on the definition which suited both areas. North (1990 p. 3) gave the following definition of institutions, “[they] are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction.” In contrast, eighteen years later, Scott defined institutions as: “Institutions are comprised of regulative, normative, and cultural-cognitive elements that, together with associated activities and resources, provide stability and meaning to social life” (Scott 2014, p.49). Institutions theory has been confirmed to be one of the famous and well-known theoretical foundations which can be used as a lens for exploring different research areas including political, economic and organisation theories (Bruton et al. 2010).

It is believed that the adoption of institutional theory benefitted the current research study simply because of its flexibility and ability in exploring the challenges facing e-government implementation in a chaotic environment. Several studies discussed institutional theory as being purely socio-political and management related (Helmke & Levitsky 2004). However, some of these

studies introduced institutional theory in the context of e-government research (Hassan & Gil-Garcia 2008). Based on these two studies, the institutional theory can be briefly introduced as follows: institutions are common sets of rules and practices that form the perceived appropriateness of social behaviour. It is a social reality where human construction is created through interaction.

Institutional theory is widely accepted and used in research related to the diffusion and adoption of new structural practices (Powell & DiMaggio 1983, 1991; Scott 2014). It has been argued that the interaction which is established within the human construction can be considered as a social reality (Scott 1987, p.117). There are three main types of pressures that affect institutions in general. Scott (1987) and Pulman (1991) named them “the mechanisms of isomorphism” (Powell & DiMaggio 1991; Scott 1987; Kung et al. 2015); they are coercive pressure, normative pressure and mimetic pressure. The following section provides a brief introduction to these types of institutional pressures.

3.9.1 Coercive pressure

This is the pressure that comes from higher authorities within organisations and is imposed on targets who are lower in the power structure; for example, when a parent company imposes its policies and regulations upon a subsidiary company. It is sometimes an informal or formal environment that causes this

pressure, which is exerted on organisations which depend on the expectations of the surrounding society's culture (Powell & DiMaggio 1991, p.67; Kung et al. 2015).

3.9.2 Mimetic pressure

This is an emulation of other institutions' activities or systems. These structures and systems do not necessarily come from coercive authority (Kung et al. 2015). It was argued by Powell and DiMaggio (1991) that this type of structural system is copying and imitating, by creating similarities among institutions, which in turn attract career-minded employees in an unintentional way. Mimetic isomorphism is a procedural aspect. Under circumstances of uncertainty, copying the innovations that are expected to be useful to enhance legitimacy is desirable. Copying is a simplified approach within institutions to imitate each other, especially in technology adoption.

3.9.3 Normative pressure

This is the third pressure factor, which is related to the influence of professional individuals within a community on an institution. Normative forces are related to those standards and norms that highlight the influence of the training and education processes on the ability to adopt new technology among communities (Kung et al. 2015). Normative pressure emerged as a natural result of mimetic pressure to implement e-services innovation and then that innovative e-service became a required standard service (Kung et al. 2015).

3.10 ***Formal and informal institutions based on institutional theory***

Institutions can be split into two main categories: formal institutions and informal institutions, where each of them impacts on shaping the state of institutions in general (Helmke & Levitsky 2004; Hassan & Gil-Garcia 2008). Informal institutions are based on ethical and moral standards which cannot be legislated by the government or corporate social responsibilities. Although all formal rules are established from ethical and moral standards, not all of those ethics and morals have been included in the law. Informal institutions are based on mutual social trust, while formal ones have less contact within a social context (Seyoum 2011).

According to Helmke and Levitsky (2004), formal institutions are oriented towards public scrutiny and provide a framework of recognisable forms of society. Whereas, informal institutions are rules which form the social interactions. It is more challenging to identify these only because their rewards are less articulated (Helmke & Levitsky 2004). Ideally, as Jütting (2003) suggested, informal and formal institutions should complement each other. According to Alonso (2009), informal institutions which are based upon kinship, proximity and relationships in developing and least developed countries are highly efficient. In addition, informal institutions represent the social norms, taboos and ethics among the citizens and institutions of civil society (Helmke and Levitsky 2004). It has emerged from several studies that during times of crisis and fragility the role of informal institutions is highlighted

in this type of environment, rather more than in stable and normal conditions (Pejovich 1999; Jütting 2003; Messineo and Wam 2011; Pitlik and Kouba 2013; Marosevic and Econ 2013).

Estrin and Prevezer found that informal institutions can substitute for and sometimes replace ineffective formal ones (Estrin and Prevezer 2011; Chan et al. 2015). Also, despite the existence of China's mediocre formal institutions, the strength of the informal associations has helped the development of China over the last few decades (Chan et al. 2015).

Williamson's (2009) study found that the success of any formal institution depends mainly on the ability to map onto informal rules. The mapping process is difficult to stop, the consequences are unpredictable, and the arrangements may result in an asymmetric outcome. Therefore, setting the right mix of institutions and at the same time predicting the subsequent influence on development is difficult and varies from one country to another (Williamson 2009).

To summarise, the institutional theory can offer a significant lens to explore the impact of informal institutions on the implementation of e-government services in a chaotic environment, taking advantage of the lessons learned from the success of e-passport and NID implementation in Libya.

3.11 ***Summary***

In conclusion, the research topic of this thesis was inductive and deductive. Thus, a mixed-method approach was suitable as it was an exploratory study. At the same time, studying the feasibility of e-government implementation in the state of Libya identified the flexibilities and complexities arising. However, the positivist approach was used in the form of a questionnaire survey as a backup tool to support the interpretivism approach which used the qualitative method, and at the end to develop and generate reliable data for analysis.

Chapter 4: **Government and Citizens' Perspectives Qualitative study**

4.1 ***Introduction***

This chapter introduces the two qualitative studies which were conducted to explore both government officials' perspectives and citizens' perspectives about the implementation of e-government. While previous academic studies have mainly examined varieties of e-government issues within a stable environment, whether those studies have been done in developed or developing countries, this study examined the case from different perspectives and focused on studying the feasibility of implementing E-Government in a chaotic environment. It measured the critical success factors of e-government implementation in a chaotic environment.

The first qualitative study that was considered was a pilot study that targeted six government officials which were all interviewed. After an in-depth analysis, it was found that some e-services have been implemented within this environment. The theoretical framework of the CSFs, which was discussed in chapter two, were superimposed and pattern matched with the pilot study and reanalysed. Several themes emerged through this analysis. One of the themes that was emerged from this study was the implementation of e-passport and NID which was taken forward to explore the success story of this project. The the other qualitative study targeted 14 citizens to collect their

perspectives and their opinions about the success story of the e-passport and NID which emerged in the first study. The analysis is initially conducted manually, it is then applied in the qualitative data analysis software (NVivo) to aid in data management and classification.

4.2 ***Ethical approval***

In business and technological research, ethical approval is quite significant and is an essential step that should be carried by the researcher (Saunders et al. 2009; Quinlan 2011; Creswell and Plano Clark 2011). The researcher followed the University of Bradford guidelines and procedures to ensure there was no risk or harm, either to the researcher or the participants, at any point during or after data collection. Ethics approval was granted twice by the Chair of the Humanities, Social and Health Sciences Research Ethics Panel at the University of Bradford on the 16th of February 2015 and on the 28th of March 2017. The First one for the interviews which conducted with the government officials and citizens, where a consent form was sent to each participants together with the interview questions written in English and translated into Arabic to ensure the privacy of their given information. The second approval was for the quantitative study that conducted at the end of this research. In the questionnaire, the first page is a consent form written in English and translated into Arabic explaining all of the potential ethical issues to the participants. After reading it, the participant is obliged to respond either by noting YES if he understood and was willing to participate, whereupon he would be guided through the questionnaire items starting with the

demographic questions. If the participant was not willing to participate, clicking "NO" would allow to exit the questionnaire. The participant was able to withdraw at any time or level after starting the questionnaire.

4.3 *Government perspectives pilot study*

4.3.1 Introduction

The situation in Libya is unique. Thus, it is worth researching how government institutions and agencies can be given insight into the significance of adopting E-Government technology. It was apparent that e-passports and NID number were successfully implemented in Libya. Therefore, a pilot study was conducted to aid understanding of the reasons behind the successful implementation of these e-government services. This would also benefit in exploring the possibility of implementing other e-services.

There are limited resources available within this area of research. The one other study that was identified is of Khan et al. (2012). Therefore, it was felt that this investigation can effectively contribute towards the current situation of E-Government in the state of Libya. It also explores the feasibility of E-Government acceptance within the government officials and agencies. This research is initiated by collecting literature to form the literature review, several Libyan government officials are then contacted to build up an accurate picture considering the current chaotic environment. The main aim of this pilot study is to answer RQ1.

4.3.2 Participants in data collection

The key individuals who are involved in the semi-structured interviews are as follows: an ex-minister, two deputy ministers and three key senior officials involved in the e-services development process in the current and previous Libyan governments, specifically those who are involved in or aware of the e-government projects. Table 4-1 below provides details about the targeted interviewees.

Table 4-1: Participant List

S/N	Designation of respondent	Interview tool	Duration
I1	A member from Islamic Banking – Libya	Skype	One hour
I2	A Manager at Free Zone	Viber	45 minutes
I3	E-government official member	Skype	One hour
I4	A Deputy Minister	Viber	45 minutes
I5	A Former Minister	Viber	One hour
I6	A Manager at National Economic Development Board	Viber	45 minutes

All participants were asked 17 semi-structured questions, see the appendix (A). The interviews were conducted using Skype and Viber, where the duration of each interview ranged between 45 to 60 minutes approximately. They were all recorded using both the Skype Recorder and the Voice Recorder 1.0 freeware internet packages. It is also pertinent to mention that the interviews were transcribed, which in fact increased the richness of the data.

4.3.3 Extracted information

The ICT infrastructure is well undermined, but despite of this some provision of e-government services can still be achievable. Therefore, the interview process and information collected is considered as a success.

Upon an in-depth analysis of interviews both manually and using the NVivo 10 software, it was found that there had been successful e-service implemented during this period of conflict. These services were e-passports and NID. To the date of the interviews, both were the only services made available to public. These services are discussed in the next section.

4.3.3.1 E-passports and NID are the only successful government services provided in Libya

All interviewees appraised the NID and e-passport services that were offered by the government agency, known as "The National Number Project and associated projects" (NID 2015). This agency directly reported it to the Prime Minister, attracting the top management support. Two of the interviewees stated that, "despite the consequences of the conflict, this project has been successful and helps in fighting corruption". As an example, the authorities discovered many cases of workers who had more than one job and earn more than one salary. They stated that, "NID helped in saving a considerable amount of money from the yearly salaries budget which was returned to the central bank".

The other successful associated project within the NID project is the e-passport, which was initiated just after the NID project had completed. The discussion with interview participants has shown that both services were, in fact, one single project which had been initiated by the independent government agency (NID 2015). One of the interviewees, who was a member of the e-passport project stated, "The only successful project after the revolution was the e-passport". He added that, "the committee responsible for that project faced many barriers during their work on this project, those obstacles created by the old system individuals who resist the intended change".

In response to interview question number 11: "Would an investment by government in online services make a difference in your life? If so how?" all six interviewees insisted that online services and e-government would bridge the gap and build mutual trust between the government and citizens. It would also enable the services delivered to be more efficient. In addition, the government should focus on the services that are required by citizens on a daily basis; for example, organising health care, and paying bills and civil services delivery. The interviewees concentrated on this issue, because some of them had been involved in different e-projects in the past and others were aware of these problems during and after the implementation processes of these projects.

4.3.3.2 Geographically Remote Areas and the role of e-government

Interview participants stated that Libya has a wide area where cities and villages are widely scattered, hence they need the government services to reach them. Loses of young and qualified youngsters to larger cities who went for a better available services and job opportunities, is quite troubling and affecting the demography. As a result, such remote areas and villages would suffer from lack of manpower hence depriving the area. Three of the interviewees raised this issue and believed that e-government and online services can encourage the bringing of investment and local development into those deprived and remote areas. This may help creating a demographic balance in the country. On the other hand, travelling long distance to the main cities to receive their public services endangering the safety of citizens during the normal situation let alone in the chaotic situations.

Therefore, e-government services could contribute towards attracting businesses to those remote areas and enhance the local services for citizens to retain stability and create safe environment.

4.3.3.3 The role of E-Government in Corruption Reduction

From the analysis of the transcribed interviews it can be concluded that the rooted corruption status is quite obvious within the Libyan government institutions. Several participants have addressed the issue of corruption and other related practices. The current situation reflects the deepness of the rooted corruption and the willingness of citizens to accept the change. One of

the participants stated "citizens became frustrated because of the inherited and rooted corruptions". The other one said "if services put online, they will reduce cost and time and on top of that will reduce corruption and maintain the trust among citizens in government". While the others are aware of the impact of the e-services on corruption in general, they insist on government to implement the online services especially in the financial corruption in related institutions. The interviewees stated that the NID had saved a lot of money for the state which was supported by several reports (Khamallag et al. 2016; Forti et al. 2014)

In conclusion, the three success factors emerged from the government perspectives are: the successful implementation of e-passport and NID; the role of e-government in retaining stability to remote areas, and the role of e-government in fighting corruption. For exploring the success story of implementation of e-passport and NID this factor was chosen to be further addressed in conducting further studies. The other two themes can be addressed in suggested further studies.

4.3.4 Analysis of government perspectives

The chaotic situation of conflict experienced by the state of Libya since 2011 has cast a shadow over daily life, including the economy, politics and citizens' daily activities (Britannica 2018). This was clear and easily grasped from the emergent results. The transcribed interviews, which were conducted during the pilot study, were revisited and reanalysed based on the critical success factors found in the literature review, using both the manual method and the

NVivo 10 software. This analysis was performed on an unstable country, which has been in chaos since the uprising in 2011 (Amnesty International Secretariat Office 2015), principally to test those critical factors of e-government implementation within the country in this situation. The study was conducted at the peak of the conflict and chaos, when the participants were under the effects of the situation and their focus was on those factors which reacted with the situation and had higher response values. Consequently, the factors with the lowest response values were the factors related to technical issues.

The result showed some agreement and compatibility with most of the factors found earlier by scholars. There were some factors that did not conform due to the current situation, and the fact that the implementation phases were fluctuating and unstable. On the other hand, three new critical success factors emerged, which are discussed in detail in the next section. The following Table 4-2 shows the critical success factors together with the number of references found in the transcript of the interviews. A zero reference means there is no reference and that the issue was not raised in the interviews.

Table 4-2: Illustrates the critical success factors with the number of coded references corresponding to each factor.

Critical Success Factor	References
1. Good Information Quality	0
2. International Support	0
3. Relative Advances	0
4. Technical Staff	0
5. Tribal Heritage	0
6. Funding	1
7. Good Outsourcing Strategy	1
8. Quality	1
9. Reward System	1
10. Security	1
11. Support Interoperability	1
12. Business Process Reengineering (BPR)	2
13. Distribution Pattern of Population	2
14. ICT Standards	2
15. Training	2
16. Age Structure	3
17. Education	3
18. Family Ties	3
19. Good System Usability	3
20. Vision	3
21. Deal with Bureaucracy	4
22. Good System Quality	4
23. Organisational Culture	4
24. Organisational Structure	4
25. Religion	4
26. Best Practices Consideration	5
27. Strategy	5
28. Strong Leadership	5
29. Citizen-Centric	6

30. Good Coordination Among Project Participants	6
31. Policies and Legal Issues	6
32. User(citizen) Computer(Internet) Literacy	6
33. User-Citizen and Stakeholders Involvement	6
34. Political Support and Stability	7
35. Collaboration	9
36. Top Management Support	9
37. Change Management	10
38. Citizen Relationship Management (CiRM)	10
39. Good Partnership With Other Government Institutions	10
40. Good Planning	10
41. Implementation	10
42. Trust	10
43. ICT Infrastructure	11
44. Good Services Quality	12
45. Geographical Nature	13
46. Attitudes Towards Technology	18
47. National Information Infrastructure	18
48. Citizens' Safety	19
49. Trust in Government Institutions' Commitment	21
50. Awareness	25

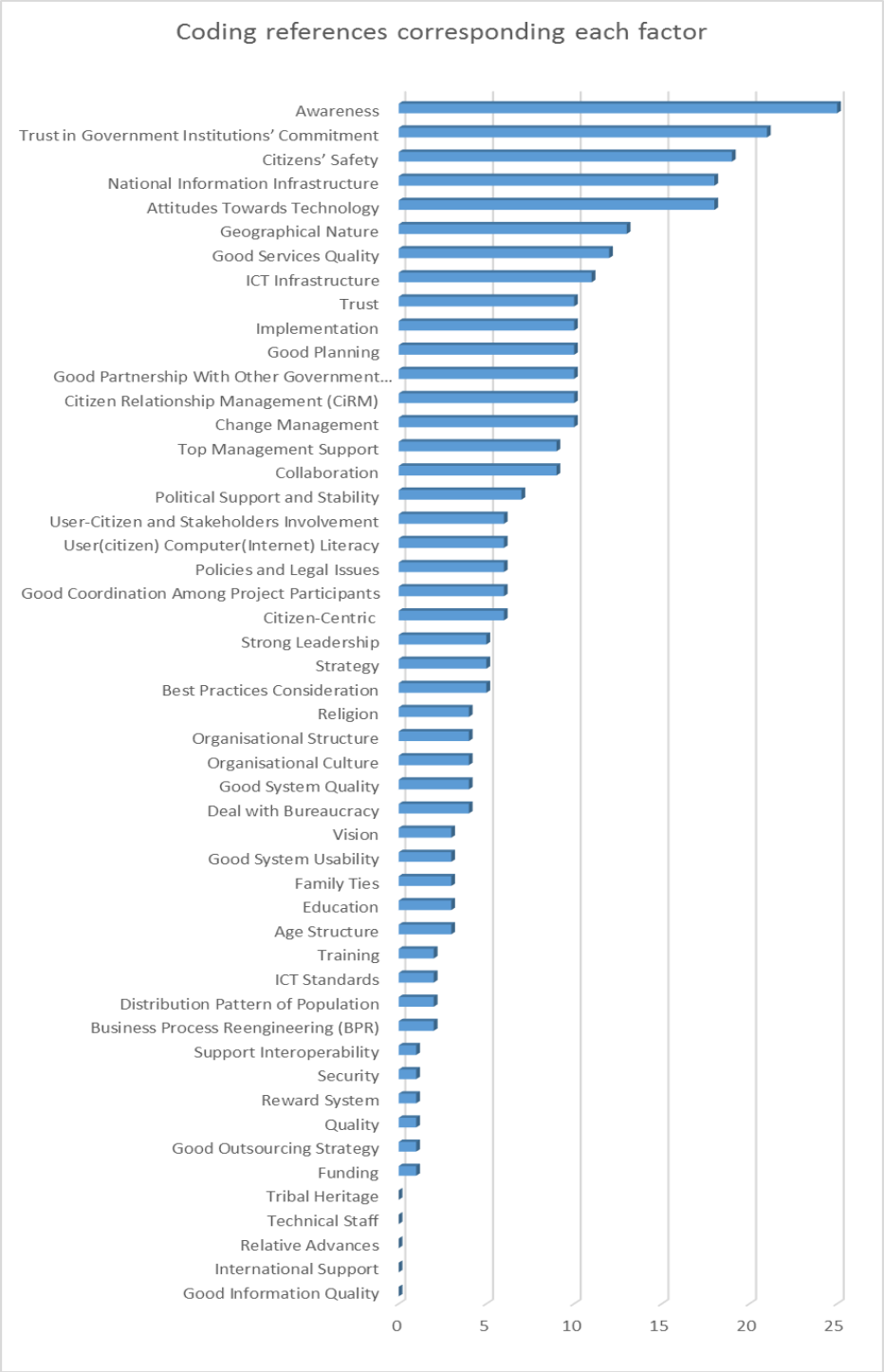

Figure 4-1: NVivo - Output for the Emergent CSFs

4.3.5 Findings

There are newly emerged CSFs that influence e-government implementation in a chaotic situation. These factors are citizen safety and government institutions' commitment. They are defined, discussed and analysed in the following sections.

4.3.5.1 Citizens' safety

Citizens' safety means prevention and protection of citizens from involvement in incidents and risks that could cause them long-term harm or threaten their lives (Zhang et al. 2011; Christin et al. 2013). Libya is one of the largest countries in the northern African area. The population density is concentrated on the coastal areas and the oases in the desert. The overall area is 1.76 million km^2 and the population density is 3.6 people per km^2 (WorldBank 2014). Goldsmith (2003) posited that "People are seeking new, better ways of ensuring their safety" (Goldsmith 2003, p.4).

Citizens all over the world have reached a point where they expect to access E-Government portals from wherever they are and without travelling long distances, especially citizens in urban areas who wish to use their mobile devices (Christin et al. 2013). In addition, digital has the potential and promise to increase the effectiveness and efficiency of government agencies and institutions, by providing online public services

accessibility, 24 hours per day and seven days a week (Melitski et al. 2011).

The evidence mentioned above goes in parallel with that which has been emerged from the analysis process of the pilot study; there are 19 quotes in the transcription related to this theme, which are shown in the Table 4-3 below.

Table 4-3: Quotes Related to Citizens' Safety Theme

Participants - Question Number	Quotes from participants' transcripts related to citizen safety
I5-Q6	"The citizen should go miles and miles to get these services."
I3-Q8	"Because it removes the citizens from suffering queueing, travelling long distances and wasting their time, it will reduce cost."
I5-Q8	"The existing situation does not allow the electronic services to be available because the situation on the ground is chaos and armed conflict."
I1-Q9	"The services which affect the citizens in their daily needs. They should get them electronically in their location."
I5-Q11	"They get them without suffering; they will be able to access the building and development directly."
I1-Q12a	"Safety factor, through preventing people from travelling a long distance to get these services which can be provided online. As an example, to renew a passport now in Benghazi, they have opened an office in a

	school surrounded by fighters, and people are queuing to apply to renew their passports. If this is available online, it will be easier for them."
I1-Q12b	"Also, with regards to the refugees and following their needs, so the Red Crescent and charity agencies can provide services for the needy. This could be known and followed electronically, that would be more fruitful and accurate in addition to preventing the chaos and violence."
I1-Q12c	"These services can be provided online which will save lives."
I3-Q12	"As a result of this decline in the level of public services, there are people nowadays who claim to have declared independence from the main country or want divide the country into federal or regional states."
I4-Q12	"As long as the citizen in that geographically distant region can pay his bill online and get his daily services electronically, through his mobile or an internet kiosk, he does not need more than that."
I6-Q12	"So, citizens will save time going to the main cities to get their services."
I1-Q16	"Due to the suffering experienced by citizens when getting the services mentioned by travelling long distances, several times. That travelling will cost them a lot of the time and money and the possibility of exposure to other risks."
I3-Q16	"Stopping the migration of local citizens to where the services are. The services should be in each city, town and village around the country to reduce the political tensions. The services should reach every citizen wherever he is to sustain local and regional development. The capital cities are for their people; no more crowded big cities."
I4-Q16a	"Libya has faced the worst-case scenario for forty years. Citizens struggle for just the simple and trivial services which should be provided by the government electronically."
I4-Q16b	"There are obligations on any government to provide these remote cities with the services needed and to stop the problem of travelling long distances to the main cities for services which are their rights."
I5-Q16	"As we all know, Libya has geographically distanced areas. The existence of electronic government will improve the services for all the

	citizens, and that will reflect positively on their loyalty and sense of belonging."
I1-Q17a	"Applying e-government can reduce the effect and consequences of this chaos and violence and help to prevent the expansion of chaos and wars for the long term. Because the effect of this conflict is on the daily life of the citizen."
I1-Q17b	"E-government and the aspect which is related to safety and security issues can help to exchange information related to the refugees, to provide their exact need for food and healthcare more accurately and on time, without any corruption which can accompany a manual system."
I3-Q17	"The conflict and chaos in Libya are economically based and nothing to do with ethnicity or religions or minority groups. We are one race. The services should reach everyone in the country."

Regarding the citizens' safety factor, and because of the geographical and demographical nature of the state of Libya, the participants stated that citizens were suffering from travelling long distances to obtain simple services which could have been dealt with quickly by their local governments by putting such services online (I5-Q16, I1-Q16, I4-Q12, I6-Q12, I3-Q8, I4-Q16a, and I4-Q16b).

Other participants had seen that this lack of online public services delivery had created political tension and violence within those remote areas in the country. This tension encourage minorities and deprived areas to ask for self-rule, which could result in independence from the country and involve citizens suffering from persecution (I3-Q12, I1-Q17a, I1-Q17b, and I3-Q17). The remainder of the quotes focused on saving citizens time and effort, which positively reflect on citizens' lives and safety (I1-Q12a, I1-Q12b, I1-Q12c, and I5-Q8).

4.3.5.2 Trust in government institutions' commitment

According to Rose et al. (2015), the lack of commitment towards e-government implementation together with other factors could lead to a failure of these initiatives. This commitment, which is related to all government components, agencies, departments and institutions, is well integrated with the other critical success factors, like vision and proper planning. Therefore, these integrated factors will allow the implementation to fail, and the goals will not be achieved without commitment from all government institutions (Pan et al. 2006; Rose et al. 2014). Trust in the commitment of government institutions is widely acknowledged in the area of ICT and innovation implementation (Mpinganjira et al. 2015).

The definitions mentioned above overlapped with the results that emerged from the pilot study analysis process. There were 21 quotes from the interview transcriptions related to this theme, which are shown in Table 4-4 below.

Table 4-4: Quotes Related to Government Institutions' Commitment Theme

Participants - Question Number	Quotes from participants' transcripts related to trust in government institutions' commitment
I1-Q17	"Electronic government is a way of communication between the government and the citizen, and it must fulfil the commitment of the government to all citizens."
I2-Q17	"The government should make this project one of their top priorities and reserve the necessary funds for it to gain the citizens' trust."
I4-Q17	"E-government will be one of the government tools to build trust in citizens and encourage them to work for development and reconstruction rather than conflict and chaos."
I5-Q17	"When the citizens feel that the government is committed to coming to them wherever they live and the public services are delivered to them, whatever their areas or ethnicity, sure the trust in the institutions will increase by their commitment."

It emerged from the analysis of the interviews that the lack of government commitment to the e-government implementation initiatives from several Libyan governments who took over the country after the 2011 uprising, was the reason behind the lack of electronic public services delivery. The participants stated that the commitment to e-government implementation from all the government institutions will lead to mutual trust and citizens' satisfaction.

On the other hand, other participants linked commitment to the collaboration between government institutions and other private

agencies. The remaining participants linked commitment to the development of sustainability and felt that the government should give equal priorities to the necessary and urgent services delivery.

4.4 ***Citizens' perspective study***

The second study was conducted to explore the citizens' perspective, especially regarding those e-services which had been successfully implemented in the current chaotic environment and were raised by the government officials in the previous study (Khamallag et al. 2016). This was the e-passport service. It was applied in this phase to investigate the citizens' experiences and opinions about the factors affecting the day-to-day processes of this e-service. Due to the revolt, conflict, lack of communication and instability of the electrical network infrastructure in the state of Libya, the researcher was forced to diversify and use the tools available to collect the primary data. The aim of this study is to find the an answer for the RQ2.

4.4.1 Participants' sample selection criteria

The sample selection process was achieved by snowballing students who had just arrived from Libya. It targeted those citizens who had recently had the experience of issuing an e-passport, either within the offices in Libya or from the offices available in some embassies outside the country. Three data collection techniques were followed during this stage. The first was an announcement on a social networking forum to

reach students studying abroad, all over the world. The announcement was prepared in the Arabic language, as follows: "I am a PhD student at the University of Bradford, UK. Looking for people who have applied for an e-passport during this year 2016. If anyone is able and willing to participate, please reply back to this message privately." As a result of this message, 12 responses were received, from which the researcher chose eight to participate in the project and arranged for interviews. The interviews were conducted using emails, face-to-face meetings, Viber, and Facebook chatting (James 2015), as illustrated in Table 4-5.

Table 4-5: Interviewed Participants

s/n	Tools	Number of participants
1	Face-to-face	3
2	Viber	2
3	Emails	8
4	Facebook Chatting	1

Three trusted collaborators with full knowledge of the project were selected to recommend colleagues; as a result this snowballed further participants were contacted based on their friends' recommendations. In total, eight people replied positively to the emails after the questions and the consent forms had been sent to them.

Data collection was conducted between July and August 2016, which involved 14 participants from different disciplines and areas. Three were MA students studying in the UK, France and Malaysia. Four participants

were engineers working in the oil sector in Libya, two participants were lecturers working in the education sector from different areas in Libya and two were officers working in the Ministry of Internal Affairs. The face-to-face interviewees were with two students who had just arrived from Libya to the UK to study, and their interviews lasted for approximately 30 minutes each. One interview was conducted using Viber, which lasted for 20–25 minutes. Viber and face-to-face interviews were all audio-recorded and transcribed immediately to ensure accuracy; they were heard twice and each transcript was compared to find any errors. The reply from the email interviews came within three days from sending the questions and the consent form. Three of the emails were in the English language and required no further input, whereas the other interviews were translated from Arabic to English.

The reason for targeting citizens who had experienced the process of issuing an e-passport was mainly to learn from their experiences in the current situation. The questions asked are presented in appendix (B).

4.4.2 Analysis and findings

After the in-depth analysis of the interview transcripts using a variety of tools, three success factors emerged. They are as follows: citizens' social collaboration, corruption and infrastructure. The following sections include a discussion of each of these success factors, together with the presentation of the participants' opinions through their related quotes.

4.4.2.1 Citizens' social collaboration

Pipek et al. (2014) raised the issue of the importance of social collaboration and its impact on crisis management. They focused on collaboration among organisations and societies, as well as individuals to overcome the drawbacks of any crisis. Difficult situations sometimes aid in promoting social collaboration (Nicola Lettieri 2015). On the other hand, Byrne et al. (2012) found that civil war and conflict usually create an atmosphere for government institutions to emerge and provide a better start for economic development. Regarding cooperation, they also added that increased local cooperation explains the reason behind the economic recoveries of countries which have experienced a post-conflict situation (Byrne et al. 2012).

Based on the above background of social collaboration, and after an in-depth analysis of the participants' transcripts, it was apparent that most of them have benefitted from the social collaboration that they have used. They identified that they received help from friends, family members, colleagues, or even friends of friends and relatives, to go through the process of issuing the e-passport or even to book the online appointment. The responses of the interviewees related to the process of issuing an e-passport are illustrated in Table 4-6 below.

Table 4-6: Citizens' Social Collaboration Factor

"People collaborate and help each other, especially those who lack knowledge of using the internet and filling online forms which are usually done by family members and friends".
"In some cases, they must use informal procedures, such as family members and friends to facilitate the process".
"… there is no possibility to get the online reservation via the internet. I have tried for several months to reserve an appointment for my family using the website, where the system replied to me that all appointments were reserved. Then, after a phone call to one of my friends, he did the reservation for me."
"To get an urgent and quick appointment at the city you prefer, sometimes you need someone to help you, either within the e-passport department office or people you know. This is the way I followed during the issuing process, where I talked to a friend of mine to make the appointment. If you have no friends or a good connection with people working there, you will not be able to get the appointment in the proper way especially when you have an urgent case."

Regarding peacekeeping, Lederach (1997) stated that in a time of conflict, crisis or a chaotic environment, the responsibility for peacekeeping and conflict resolution rests with all activists on the scene. He posited that those at an "international level, regional, national, local and even interpersonal level" can all take part in conflict resolution and peacebuilding through the collaboration of political, military and religious leadership down to the grassroots activists (Lederach 1997, p.39). Therefore, it becomes clear that the spirit of the social collaboration factor is essential in technology innovation diffusion, especially regarding the role of e-services. From the above quotes, it is apparent that connections and friendship can do much in facilitating and accelerating the problematic processes, especially during instability.

4.4.2.2 Second factor: corruption

Based on the findings of different scholars and the World Bank, as mentioned earlier, this factor emerged as a result of implementing the e-passport services. The citizens believed that these e-services will fight the corruption that has caused deterioration in all of the government's institutions. Hence, the main keywords that appeared within the participants' transcribed interviews which help in the emergence of this theme are as follows: "accuracy", "validity", "easy to use", "easy to process", "imposing law", "corruption" and "anti-fraud". The following Table 4-7 contains the quotes which support this emergent success factor:

Table 4-7: Corruption Factor

"I am personally supporting the process of putting all the services online. As an example, to save time, money, and effort. Also, to reduce the bribery, administrative and financial corruption and fraud. That will lead to reducing the government spending and congestion."
"…..the accuracy of the information and error-free documents and data."
"…. The difficulty of forgery."
"*I believe the NID and e-passport can be considered as huge systems which have stopped a wide range of corruption, like issuing passports to people who are not Libyans and it is a step to preserve the identity of citizens and the country. I wish the government would follow the roadmap of these two systems and do other services online which offer safety, save time for citizens and the country as a whole."*

The daily lives of citizens have been affected by the corruption rooted among the leading institutions and organisations, especially during the

conflict and subsequent chaos. Therefore, it is clear from the quotes that citizens are currently expecting a great deal from the implementation of these two electronic and centred systems, mainly to fight corruption, and to make life more comfortable for citizens who have difficulty obtaining their day-to-day services. From those quotes, citizens are aware of the benefits of having online services regarding e-government, which in turn will reduce the consequences of all types of corruption and help the government to be accountable and transparent to their citizens.

4.4.2.3 Poor infrastructure

This factor emerged during the interviews in general, and especially when the participants were asked about the available infrastructure that they could access. The majority of the participants expressed their indignation about the poor state of all the infrastructure. Despite this, they have methods to provide services to their sectors and the areas where they work and live in. Communication networks and electricity networks are severely unstable and dilapidated. Some of the geographically-distant cities have no such infrastructure. Table 4-8 shows the quotes as a sample of the participants' responses during the interviews which illustrates the themes led to the emergent factor.

Table 4-8: Infrastructure factor

"Most of the citizens do not have broadband at home and need to find offices or somebody to do the reservation for them."

"Most of the Libyan cities are suffering from electricity cuts for 3 to 5 hours per day, and sometimes more."
"In the countryside, there is mostly no internet service, or it is fragile, unstable, and not available for every individual. In cities, although it is available for most of them, it is slow, unstable, and not available for every individual."
"Mobile Networks - There are mobile networks, but they have low coverage and are also affected by the electricity; when there is no electricity there are no mobile services. The cost of the services is not affordable by all citizens. The internet is also very slow and affected by electricity as well."
"The electricity network is so dilapidated all over the country because of the current situation, where it needs too much effort and budget to rebuild it. Also, the electricity cuts have cast a shadow over the internet and mobile communications which were originally limited and do not cover all the areas. Mobile networks should have been added to the internet accessing infrastructure for all citizens, but has no benefit, for example, in an e-passport online reservation system. It is available only on computers using ADCL."

From the above quotes, it can be noticed that the infrastructure was considered as the backbone of any service, let alone an electronic one. Therefore, this theme is prominent in any situation, whether it is a stable or unstable environment.

4.5 ***Discussion***

The chaotic environment and conflict experienced by the state of Libya since 2011 has cast a shadow over daily life, including all elements of the economy, politics and citizens' daily activities. After an in-depth analysis of both studies conducted with government officials and citizens, the following model Figure 4-2 appeared to represent the whole scenario of the case targeted in this research. The forces influencing and affecting

the implementation process are explained in both the left and right parenthesis, and the bubbles surrounding the implementation process. While the bottom and top parenthesis illustrate the most important factors found to be influencing e-government implementation in a chaotic environment.

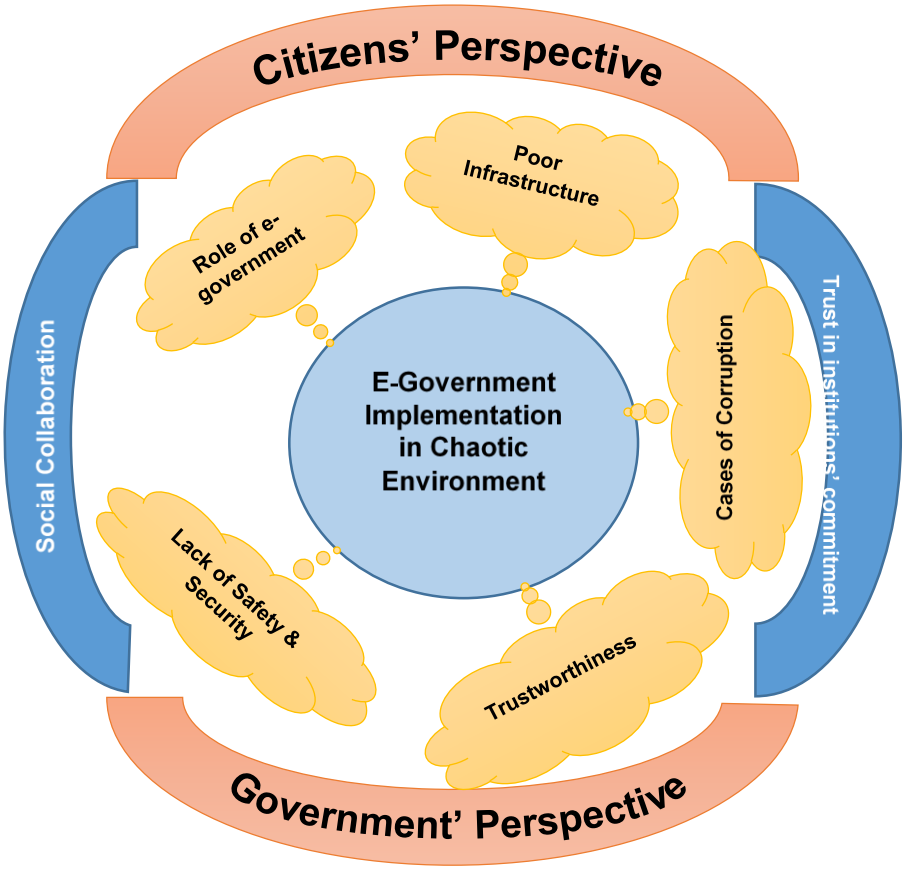

Figure 4-2: E-government Implementation Model

The analysis was conducted using an unstable country as a case study, largely to test the critical factors of e-government implementation in a chaotic situation. It was found that some participants from the government side were directly suffering from the chaotic situation; hence,

their responses were directly influenced by the surrounding environment. Consequently, the citizens' opinions on this occasion focused on working together and utilising relationships to form a collaboration to help each other. Corruption and geographical nature were factors raised by the participants in both perspectives; these are external factors and can be found in the literature review (Al-Mamari et al. 2013). Hence, they are both considered as core environmental parts compared to the other factors that are taken outside both perspectives. In other words, corruption as an environment, together with chaos and conflict on the ground, in addition to the geographical nature, together created the study environment which is illustrated in Figure 4-2.

It is apparent that both ICT infrastructure and e-passports have both been raised and emphasised several times during the analysis of the government officials' transcribed interviews. However, they are both also mentioned in another context, during the analysis of the citizens' transcribed interviews, as these two e-services were explored in detail using the citizens' experiences to view the feasibility of implementing other services online. For example, when citizens raised the deterioration of infrastructure, they were criticising the infrastructure, which included electricity supply, communication networks and even the transportation network. For that reason, when the infrastructure factor was raised, it comprised the general meanings, where the National Information Infrastructure was also included. Citizens have raised those terms in a wider perspective than the government officials, which reflects the

citizens' awareness of issues that can help the government to adopt and implement innovations. Citizens living under these shortages of infrastructure elements still managed to utilise the limited access to the internet and mobile communication to access the e-services offered, through collaboration and the spirit of cooperation mentioned earlier. Running local services by utilising the available limited mobile networks was, nevertheless, sufficient to make e-passports a success. It remained important, however, to get the government system in place and fully functional in all cases.

Glass (1996), found that managers' thinking, and actions depend on the environment where they are working. If they are totally in or near a stable equilibrium, then managers will always work hard and ensure that they are following their original plan. On the other hand, in chaotic situations, managers tend to look for positive intensification that can bring astonishing results rather than just an ordinary one (Glass 1996). Managers may attempt to achieve astonishing results in a chaotic situation and this can affect the ranking of Top Management and Management of Change on the list, which has been illustrated in a previous study (Khamallag et al. 2016). Also, various literature has raised the point that senior management support and change management are important during the implementation phase of any project, especially e-government (Bingi et al. 2006; Elbanna 2012; Young and Poon 2013). Furthermore, the previous study also found that those two factors are important, but with different ranks in a chaotic environment (Khamallag

et al. 2016). However, the current difficult situation has cast a shadow on the citizens' perspectives; they emphasised the unseen support provided by the departments related to these two e-services and the management style they were following. This was apparent in the implementation process. Otherwise, the e-services would not have existed, especially in such a chaotic environment.

4.6 ***Summary of findings of government and citizens' perspectives***

The findings of both studies are summarised in this section and will be applied in the next stage of the research to formulate the research model to be tested using the quantitative research method.

4.6.1 Citizens' safety

This factor has emerged from the analysis of the government perspective interviews, which showed that the citizens are suffering from a lack of safety wherever they travel to. The context in which this factor emerged is that citizens are suffering from conflict on the ground, and it is difficult for them to travel outside to their daily jobs or to receive public services. Citizens' safety in a crisis is an issue (Olsen et al. 2007), especially when there are no institutions in place to protect them or provide the necessary services to them. This factor was considered to exist within the model. It is as a result of the chaotic situation that it will always be called "lack of citizens' safety".

4.6.2 Trust in government institutions' commitment

This factor emerged from the government perspectives, which meant that the institutions that are responsible for the implementation of e-passports cannot have this trust if they cannot implement e-passports. It has been posited by Bonasia et al. (2016) that the trust in institutions' commitment plays a vital role in establishing economic, social and political stability. Furthermore, this factor plays an important role in creating a link between the institutions and citizens. However, the lack of trust in government institutions' commitment impacts negatively on legitimacy and undermines the economic, social and political system (Bonasia et al. 2016).

4.6.3 Poor infrastructure

This factor has been raised by the citizens who experienced the lack of internet connection, electricity cuts and poor mobile signals. Infrastructure is one of the pillars required for implementing e-government services and is considered as one of the e-readiness criteria in any state worldwide (Koh et al. 2008; Zarei et al. 2008; Asogwa 2011; Limani and Stapleton 2016). Despite the fact that the government officials stated in their interviews that the e-passport has been successfully implemented, this was taken as a research topic in this thesis and the citizens' perspectives study was conducted. This is also as a result of the chaotic situation.

4.6.4 Corruption

This factor emerged from the analysis of the interviews conducted with citizens. It reflects the cases of corruption within the government institutions due to the fragile political situation which occurred after the old regime collapsed. This factor emerged as a result of chaotic environment and it will be called "Cases of Corruption"

4.6.5 Trustworthiness

This factor involves three of the main factors: trust in the internet, trust in the e-services, and trust in the government. These are taken from the critical success factors extracted from the literature review which were pattern matched with the government perspective interviews. Citizens and government officials who participated in this study are traumatised by the situation in which they live, and found it difficult to focus on the concept of trust (Mpinganjira et al. 2015). Hence, the trust concept was extracted from the pattern matching of the government officials' transcribed interviews with the collected CSFs from the literature, which does not necessarily reflect the chaotic environment or unstable conditions.

4.6.6 The role of e-government in fighting corruption

This factor was collected from the literature review, as it has been posited by Heinrich and Brown (2017) that e-government has the potential to suppress the spread of corruption and enhance the citizen's wellbeing

(Srivastava et al. 2016; Heinrich and Brown 2017). As the corruption theme has emerged from the process of analysing the participants' interviews, this factor was added based on the literature review and based on the awareness of both categories of participants of the role that e-government can play in this context.

4.6.7 Social collaboration

This factor emerged from the citizens' perspectives, which illustrated that the citizens used the e-passport system with the aid of each other. This involves a social collaboration where the citizens share their internet and facilitate people they know to receive the e-passport services. Friendship, family members or kinship, and workplace colleagues played a vital role in the issuing process in certain cities and offices. The spirit of citizens' social collaboration usually appears during a crisis, war or conflict, where the people stand with the vulnerable people, neighbours and relatives to obtain their daily needs (Lederach 1997; Byrne et al. 2012).

Finally, Table 4-9 illustrates a summary of those factors and factors that are discussed and analysed later in chapters five and six in more detail.

Table 4-9: Summary of Factors for Analysis

S/N	Factor	Sources
1	Citizens' Safety	Government Perspectives
2	Trust in Government Institutions' Commitment.	Government Perspectives
3	Trustworthiness - Trust in Internet,	Literature Review and Pattern-matching Process (Bélanger and Carter 2008; Ben Mansour 2016)

4	-Trust in e-services	Literature Review and Pattern-matching Process (Bélanger and Carter 2008; Ben Mansour 2016)
5	Poor Infrastructure	Literature Review and Citizens' Perspectives (Alghamdi et al. 2011; Rana et al. 2013)
6	Corruption	Literature Review and Citizens' Perspectives (Fjelde 2009; US Institute of Peace 2010; Bateman et al. 2016)
7	The Role of E-government for Fighting Corruption	Literature Review (Srivastava et al. 2016; Heinrich and Brown 2017)
8	Social Collaboration	Citizens' Perspectives

4.7 ***Conceptual model***

Based on the qualitative studies discussed in this chapter there are seven factors that appear to have an impact on the implementation process of e-government during chaotic environment. Figure 4-3, represents these factors in a form of conceptual model. These factors will be categorised and discussed in detail in the next chapter.

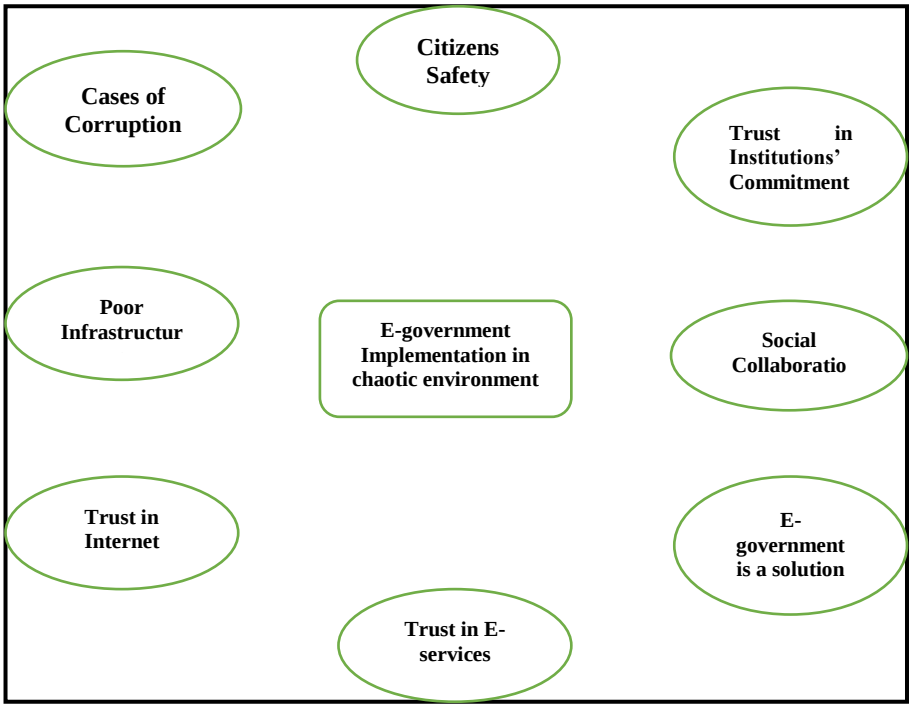

Figure 4-3: E-Government implementation success factors conceptual model

4.8 ***Conclusion***

This study has made three contributions regarding CSFs. Firstly, it has established that known CSFs for implementing e-government services in stable conditions can also be used in chaotic situations. Secondly, it has led to a better understanding of the effect of some of those factors being missing in the implementation process. Thirdly, it has identified new success factors that are worth conducting in-depth studies, to understand their impact on the implementation process.

Therefore, the results show considerable agreement between most of the factors addressed earlier by scholars and those which have emerged in a chaotic environment. However, there were changes in the ranking of the same factors when applied in a chaotic case. The study found that it is possible to implement urgent e-government services where there is limited access to the internet, such as using mobile connections. The ICT infrastructure as a CSF did not necessarily attract the same importance in this case. It, however, found that all of these factors can play essential roles in constructing a successful framework for similar cases and situations.

The chaotic environment that reflects on the initial findings of this study confirms that further investigations are needed for the delivery of other e-services. These could examine citizens' safety and government institutions' commitment. It has been found that, it would be useful if those factors that emerged earlier could be tested using an empirical

quantitative method, using the e-passport project portals for a more significant sample. The current situation in Libya was not conducive to conduct the study onsite; however, it would still be possible to use the existing (limited) communication technology and social media to engage with a larger sample of the population. This would lead to a benchmarking framework which can measure the degree of leveraging citizens' collaboration to achieve transparent, participatory and collaborative governments.

The new factors that have emerged need further investigation through empirical studies, together with the other factors that were agreed but had less priorities in this study. These factors should be tested using case studies and quantitative methods to ascertain their influence on e-government implementation within a chaotic situation. The e-passport portal, which was considered to be one of only two successfully delivered e-services in Libya during this period, is the most suitable to be used as a case study.

Chapter 5: **Research Model, Hypothesis and Survey Instruments**

5.1 ***Introduction***

Based on the success factors emerged from the qualitative studies which was discussed in chapter four, this chapter re-categorises these constructs in a form of a research model which is going to be applied in testing those findings quantitatively. It introduces each construct of the model and links them together, then introducing the hypotheses of each relationship within the model. The survey development process is then developed and the items of the questionnaire are introduced in detail. Finally, the pilot study is presented, which is conducted to check the consistency of the questionnaire items before the survey permanently put online.

5.2 ***Introducing the research model***

The success factors emerged and discussed in chapter four are put in the following categories (Deutsch 1958; Zabyelina and Arsovska 2013; McClintock and Bell 2013):

- Chaotic Environment
- Trustworthiness

- Social Collaboration

The details introductions to each category is discussed in the following sections.

5.2.1 Chaotic environment category

The chaotic environment has an impact on the day-to-day life and is considered to be a fertile ground for the spread of corruption in a country regardless of the scale of violence or conflict (Zabyelina and Arsovska 2013). Armed conflict and ineffective governing body have had a serious impact on the Libyan citizens' safety and stability where the organised crime and corruption has spread everywhere (McClintock & Bell 2013). According to the UN goals, there is a need for a good infrastructure to "develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human wellbeing, with a focus on affordable and equitable access for all" (UN 2015).

Studies which focused on the e-government adoption and implementation success factors (Irani et al. 2012; Napitupulu and Sensuse 2014; Weerakkody et al. 2011; Altameem et al. 2006) categorised the success factors in different ways. These researchers, generally, agreed upon the role of infrastructure in the implementation process, in addition to the anti-corruption strategies that are emphasised by e-government initiatives and the existence of strong relationships among each of these constructs (Kim 2014; Saxena 2017).

These factors appeared to be formulating the bases of the chaotic environment (Zabyelina & Arsovska 2013; McClintock & Bell 2013). Based on that, the chaotic environment category or sub-model consists of the following three constructs and represented in Figure 5-1.

- Cases of Corruption
- Poor Infrastructure
- Lack of Citizens Safety

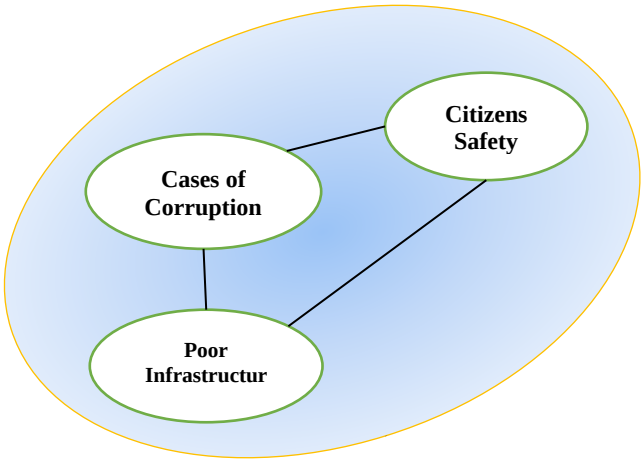

Figure 5-1: Chaotic Environment Model

5.2.2 Trust in government and institutions' commitment – model

The theoretical and empirical studies which were mentioned in the previous section, have emphasised also on trustworthiness where it considered to be an essential factor in all ICT processes (Das et al. 2009; Smith 2011;

Anthopoulos and Sirakoulis 2015; Lallmahomed et al. 2017). The formal institutions' power and influence are imperfect, especially during conflict and chaotic environments (Alonso 2009; Williamson 2009). The efficiency of the formal institutions lead to promoting the mutual trust among the related parties (Tamilina and Tamilina 2018). This trustworthiness, according to Deutsch (1958), needs a third party especially during the suspicious or chaotic environment. This third-party could either be an individual, groups, or an agency which is directly related to the law-enforcing (Deutsch 1958).

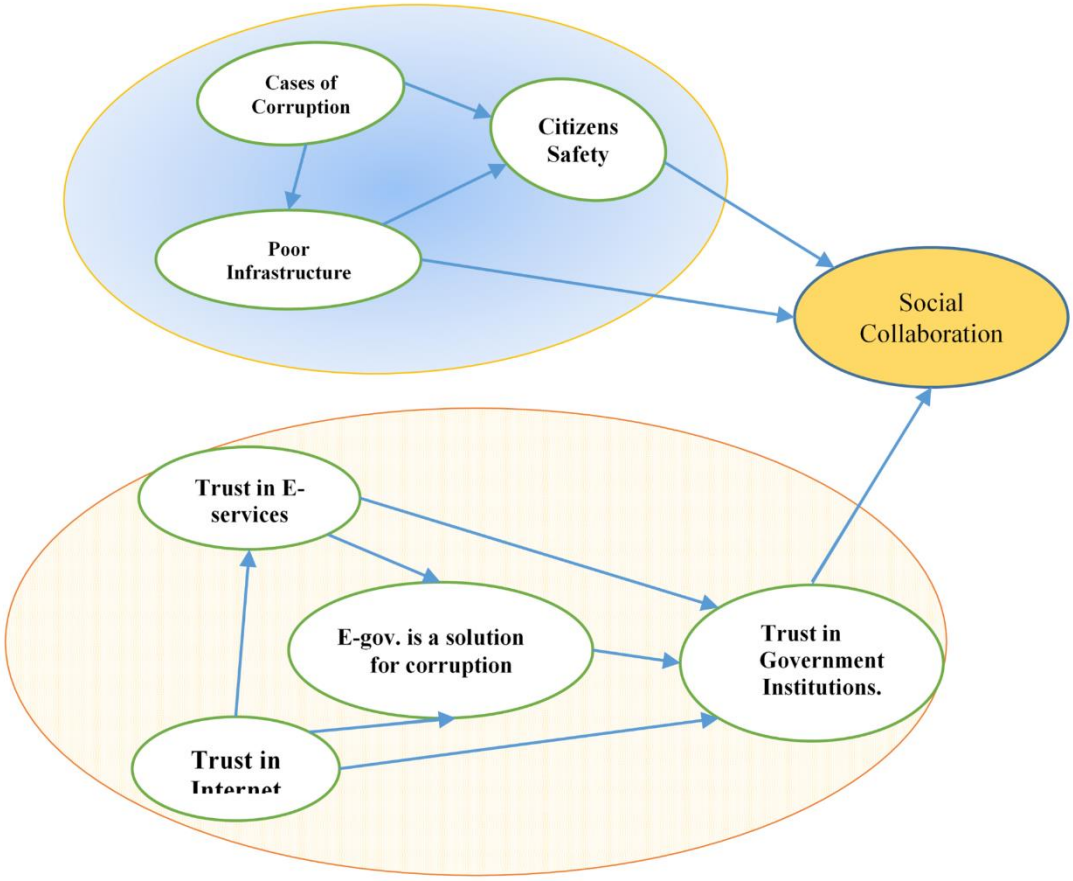

Figure 5-2: Trust in Government and Formal Institutions Commitment Model

Hence, the delivery of services is limited to delivering only those that are necessary. The following factors: trust in the internet (Alomari et al. 2012), trust in government (Shalini 2009; Morgeson et al. 2011; Porumbescu 2016), trust in e-services (Warkentin et al. 2002; Papadopoulou et al. 2010) and the role of e-government in fighting corruption (Bhuiyan 2011; Kim 2014; Kim et al. 2009), are combined to formulate the 'Trust in Government and Institutions' Commitment' model, which represents the formal institution in this context. The words institutions' commitments added as the citizens' trust in the commitment of those departments which related to the e-passport and NID processes during the current situation. Figure 5-2, illustrates this model.

5.2.3 Social Collaboration Model

This construct finalises the triangle shape of the proposed model which represents the social collaboration model. Pipek et al. (2014) raised the issue of the importance of social collaboration and its impact on crisis management. They focused on collaboration among organisations, societies, as well as individuals to overcome the drawbacks of any crisis (Pipek et al. 2014). Difficult situations sometimes help in promoting social collaboration (Nicola Lettieri 2015). On the other hand, Bayrn et al. found that civil war and conflict usually creates an atmosphere for government institutions to emerge and provide a better start for economic development (Byrne et al. 2012). Regarding cooperation, they also added that increased local cooperation explains the

reason behind the economic recoveries in countries which have experienced a post-conflict situation (Byrne et al. 2012).

5.3 *Model constructs and hypotheses*

Based on the proposed conceptual model, which consists of three sub-models (Chaotic Environments, Trustworthiness and Institutional Commitment, and Social Collaboration) a new and enriched model emerged. This model, in the light of institutional theory, reflects the characteristics of government institutions and the spirit of citizens' collaboration in using the compulsory e-services offered during a chaotic environment. The following sections introduce each construct included in the model, with their theoretical background and connection with the proposed hypotheses.

The following constructs emerged from the analysis of the citizens' and government's perspectives qualitative studies which discussed in chapter four.

5.3.1 Lack of citizens' safety

Citizens all over the world have reached the point where they expect to access digital government portals from wherever they are and without travelling long distances, especially citizens in urban areas who wish to use their mobiles (Christin et al. 2013). In addition, this has the potential and the promise to increase the effectiveness and efficiency of government agencies and institutions through providing public services accessibility online 24 hours a

day, seven days a week (Melitski et al. 2011). Goldsmith posited that “People are seeking new, better ways of ensuring their safety” (Goldsmith 2003). On the other hand, Bakrania made the following statement, “A lack of safety, security and justice impedes the provision of, or people’s access to, other services …” (Bakrania 2014), which mimics the current Libyan situation.

Citizens’ safety means the prevention and protection of citizens from involvement in incidents and risks that could harm them for the long term or which threaten their lives (Zhang et al. 2011; Christin et al. 2013). Libya is one of the largest countries of the northern African area. The population density is concentrated in the coastal areas and the oases in the desert, where the area is 1.76 km2 and the population density is 3.6 per km2 (WorldBank 2014).

The current situation has forced citizens to reduce their involvement in queuing at local government offices to obtain the limited services offered. The essential services are obtaining salaries through the local banks, for which they have no other choice than to contact the bank directly. Although, the government institutions have offered e-passport online services where the situation is not suitable and unsafe. Citizens have no alternative to using this system to book an appointment to provide their biometric information. This process is offered online, and collaboratively citizens have succeeded in following the procedure. This is mainly to preclude any possible risks because of the conflict and the expansion of weapons among the militias that formed during the revolt.

H1: Lack of citizens' safety directly impacts on social collaboration.

5.3.2 Poor infrastructure

Based on the United Nations e-government readiness index, which put the state of Libya is placed in the mid position, where the order ranking is high, middle and low. Due to this, the situation became worse during the conflict and war which initiated in 2011 and continued to a civil war since 2014. The consequences negatively impacted on the day-to-day lives of citizens in the country (United Nations 2014, p.17). The primary objectives of an e-services infrastructure are to enable citizens who reside in urban and rural areas to access public services, and to provide them with sustainable safety, security and a good quality of life (Damiani et al. 2017). The following are the hypotheses extracted from that literature:

H2: Poor infrastructure forces citizens to apply for e-passports using their social connections.

H3: Poor infrastructure negatively impacts on trust in government institutions.

H4: Poor infrastructure negatively impacts on e-government as a solution to corruption.

H8: Poor infrastructure has a relation with lack of citizens' safety.

5.3.3 Cases of corruption

Cases of corruption were represented by fraud, bribery, poor delivery of services and inefficiencies leading to poor infrastructure and delays in several other projects (Sohail and Cavill 2007). Hence, this created an atmosphere of long-term instability and increased costs and insecurity among all other projects. Based on the above, it is reasonable to accept the findings, since developed, developing, political and economic stable countries have been unable to achieve the ideal, which is daily transactions corruption free. This is also less likely in developing countries which suffer from chaotic situations and civil conflict. Hence from the above the following hypothesis were introduced to cover this construct:

H5: Cases of corruption directly impact on citizens' safety in a chaotic environment.

H6: Cases of corruption negatively impact on trust in government institutions.

H7: Cases of corruption impact directly on the poor infrastructure.

5.3.4 Citizens' social collaboration

Social collaboration means working together to achieve a certain goal (Martinez-Moyano 2006). According to Hofstede (2001), collectivism is a characteristic of the Arab culture, rather than individualism. Hence, social

influence and social collaboration are expected to be dominant factors in normal situations, and are even more important during war and conflict (Hofstede 2001). The idea of collectivism is well adopted within the information systems area, which it is represented in social media and social networks (Hoehle et al. 2015). Citizens' social collaboration in this context means that the spirit of collaboration among citizens in all cities, has enabled the simplification of an entire process. In the online passport example, the process is initiated with an online appointment reservation and ends with the biometrics and issuing process. This factor is emerged from the pilot study conducted at the beginning of this research and is one of the factors targeted in this research (Khamallag et al. 2016; 2017). This model represents the social collaboration model, which is the main finding in this research.

5.3.5 Trustworthiness

Wang noted that trustworthiness is an essential determinant of citizens' intention to adopt and use e-government initiatives (Wang and Lo 2012). Carter and Bélanger found that compatibility, trustworthiness and perceived ease of use all have direct and positive relationships with the intention of using e-government initiatives (Carter and Bélanger 2005). Citizens' trust is lead to the adoption and use of e-service portals offered by governments. Trustworthiness comprises two main dimensions: trust in government and trust in the internet. Before citizens begin to trust and use e-government initiatives, they have to trust the legal and managerial procedures and systems

which are implemented by the government to secure users and ensure their privacy and safety (Warkentin et al. 2002; Dwivedi et al. 2011).

Rose et al. claimed that the commitment of government institutions towards the implementation of e-government services lead to citizens' satisfaction and trust in government (Rose et al. 2014). This commitment, which is related to all government components, agencies, departments and institutions, is integrated with other critical success factors. Hence, without this relation, the implementation will fail. The goals will not be achieved in stable conditions (Pan et al. 2006; Rose et al. 2014), that are less so in a chaotic environment. Hence, trustworthiness is represented by three aspects: trust in the internet, trust in government institutions and trust in e-services. Therefore, from the above two sections the following hypothesis are introduced:

H9: The trust in government institutions and their commitment encouraged citizens to use the e-passport through social collaboration.

H10: Trust in the internet positively impacted on trust in government institutions.

H11: Trust in the internet is related to the e-government solution for corruption.

H12: Trust in the internet is strongly related to trust in e-services

5.3.6 E-government is a solution to corruption

Fighting corruption is one of the targeted aims of e-government implementation, and several studies in the literature have found that e-government initiatives have a positive impact on curbing corruption among institutions (Elbahnasawy 2014; Srivastava et al. 2016). This driver has emerged from both government officials' and citizens' perspectives, both of which focus on the advantages of implementing e-services as it would impact positively on fighting corruption. Kim posited that the rule of law and e-government implementation could be the most powerful tools to fight against and limit corruption (Kim 2014).

Therefore, the related hypotheses are:

H13: Trust in e-services can improve citizens' safety.

H14: Trust in e-services leads directly to trust in government institutions.

H15: Trust in e-services leads to realising e-government as a solution for corruption.

H16: E-government as a solution to corruption positively contributes to trust in government institutions.

The following Table 5-1 includes summary of all sixteen hypotheses from H1 to H16.

Table 5-1: Model constructs and related hypotheses

Construct	Description	Source in Literature	Hypothesis
Lack of citizens' personal safety	The impact of trauma on citizens using an e-passport system.	(Farsole et al. 2014; Mollah et al. 2012; Bakrania 2014; Olsen et al. 2007; Cimmino et al. 2014)	**H1**: *Lack of citizens' safety directly impacts on social collaboration.*
Poor infrastructure	Infrastructure in the e-government implementation process is vital. Hence, in cases of conflict, it is expected to deteriorate, be poor and very limited.	(Bélanger and Carter 2008; Fattah 2015)	**H2**: *Poor infrastructure forces citizens to apply for e-passports using their social connections.* **H3**: *Poor infrastructure negatively impacts on trust in government institutions.* **H4**: *Poor infrastructure negatively impacts on e-government as a solution to corruption.* **H8**: *Poor infrastructure has a relation with lack of citizens' safety*.
Cases of corruption	Corruption is a worldwide phenomenon, and more prevalent in chaotic situations.	(Shim and Eom 2008; Heeks and Mathisen 2012; Kim 2014; Sehested 2017)	**H5**: *Cases of corruption directly impact on citizens' safety in a chaotic environment.* **H6**: *Cases of corruption negatively impact on trust in government institutions.* **H7**: *Cases of corruption impact directly on the poor infrastructure.*

Trust in government institutions	Despite the absence of government during chaos, there must still be trust in the available institutions.	(Mpinganjira 2015)	**H9**: *The trust in government institutions' commitment encouraged citizens to use the e-passport through social collaboration.*
Trust in internet	The internet is the e-services platform, hence trust in it is essential.	(Mpinganjira 2015)	**H10**: *Trust in the internet positively impacts on trust in government institutions and their commitment.* **H11**: *Trust in the internet is related to the e-government solution for corruption*. **H12**: *Trust in the internet is strongly related to trust in e-services.*
Trust in e-services	Trust in e-services leads to the use of government public services.	(Mpinganjira 2015)	**H13**: *Trust in e-services can improve citizens' safety.* **H14**: *Trust in e-services leads directly to trust in government institutions' commitment.* **H15**: *Trust in e-services leads to realising e-government as a solution for corruption.*
E-government solutions for corruption	The role of e-government is evident in reducing corruption.	(Shim and Eom 2008; Heeks and Mathisen 2012; Sehested 2017).	**H16**: *E-government as a solution for corruption positively contributes to trust in government institutions' commitment*.

The following diagram in Figure 5-3 illustrates the research model together with the related hypotheses associated on each relationship:

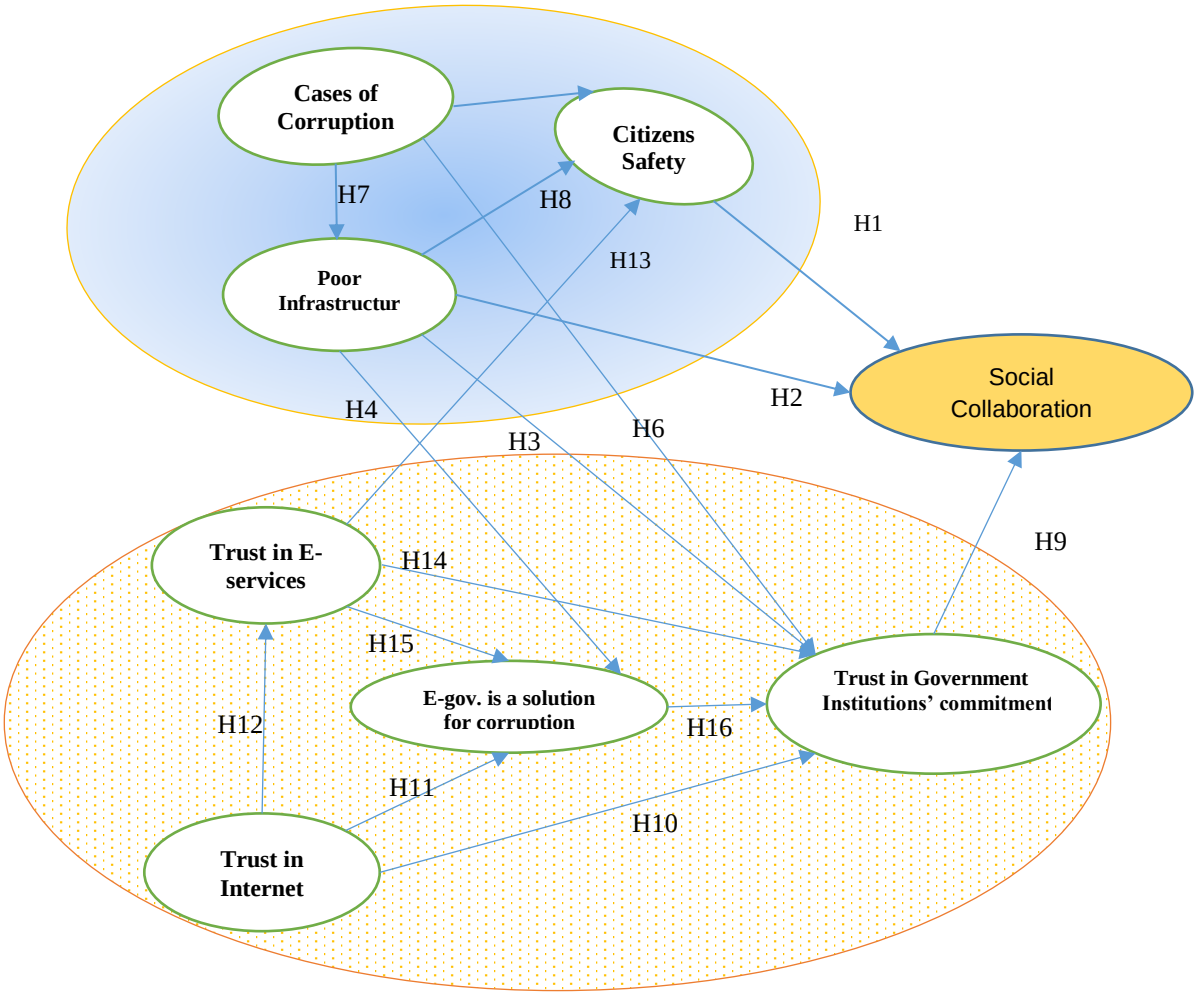

Figure 5-3: The research model with associated hypotheses

5.4 *Survey development*

Following the discussion of the research methodology which was adopted in this research, this chapter gives a detailed explanation of the development

process of each survey instrument. The researcher adopted survey instruments which had previously been tested and applied in empirical studies, in addition to a new study which was developed to suit the newly emerged factors of the chaotic environment. This was followed by the advice and encouragement put forward by several scholars for researchers to design their own instruments (Hofstede 2001; Aldrich et al. 2011, p.14).

The first construct is ‘poor infrastructure’; the following instruments were used to measure it: “How often has the following happened to you?”

1. Electrical power cut (Mohamed 2017).
2. Loss of mobile signal (Etzo and Collender 2010).
3. Loss of access to the internet (Mohamed 2017).

The second construct is ‘social collaboration’; the following instruments were applied to measure the sharable infrastructure: “How often do you do the following?”

1. Share the internet with friends (Tan 2007; Gerety et al. 2012; Samuel 2016).
2. Share the internet with relatives (Tan 2007; Gerety et al. 2012; Samuel 2016).

3. Share the internet with neighbours (Tan 2007; Gerety et al. 2012; Samuel 2016).

The third construct is ‘cases of corruption’; the following instruments were applied to measure it: “How often do you do the following?”

1. Bribery (Kim 2014; Dimant and Tosato 2017).
2. Exploitation of power (Nazeer and Furuoka 2017).
3. Fraud (Ahmed 2017; Nazeer and Furuoka 2017).
4. Wasta (favouritism) and nepotism (Ahmed 2017).
5. Seizure of public properties (Braun and Clarke 2015).
6. Multiple employment (Otar 2014).

The fourth construct is ‘lack of personal safety’; the following instruments were applied to measure it: “Which trauma have you experienced when applying for government services – an e-passport, for example?” These cases were extracted from the pilot study interviews where the citizens raised these issues because of the riots and conflict.

1. I am fearful of being kidnapped (Kimenyi et al. 2014).
2. I fear for the safety of my possessions and the risk of them being stolen (my car, for example) (Kimenyi et al. 2014).

3. I fear for the physical safety of my family (Kimenyi et al. 2014).

4. I fear being shot (Kimenyi et al. 2014).

5. I have to make careful travel plans in advance (Kimenyi et al. 2014).

The fifth construct is ‘trust in the internet’; the following instruments were applied to measure it, which were extracted from the literature:

1. I trust online an application more than a face-to-face application (Liu et al. 2002; Bélanger and Carter 2008; Mpinganjira 2015; Ben Mansour 2016).

2. The internet has enough safeguards to make me feel comfortable using it (Cimmino et al. 2014; Ben Mansour 2016).

3. I am afraid that applying online may misuse my personal information (Lee and Rao 2007; Bélanger and Carter 2008; Carter and Weerakkody 2008; Bashir and Madhavaiah 2015; Ben Mansour 2016).

4. The outputs of online services are accurate (Liu et al. 2002; Euijin and Tadisina 2007; Wang and Lo 2013).

The sixth construct is ‘trust in government institutions’; the following instruments were applied to measure it, which were extracted from the literature:

1. How much confidence do you have in government? (Ivanyna et al. 2016; Freire et al. 2014; Morgeson et al. 2011).

2. How much of the time do you think you can trust the government? (PEW 2015; Freire et al. 2014).

3. I think government institutions are trustworthy (Kolsaker and Lee-Kelley 2008; Jalali and Khorasani 2012; Luna-Reyes and Gil-Garcia 2014).

4. I respect and trust formal government institutions (Milakovich 2012).

5. I believe formal government institutions can provide online services (Kvasny and Lee 2011; Khamallag et al. 2017).

The seventh construct is 'trust in e-services'; the following instruments were applied to measure it, which were extracted from the literature:

1. Using e-government services is a wise idea (Rabaai 2015; Rabaai et al. 2016).

2. It would be desirable to use e-government services (Rabaai 2015; Rabaai et al. 2016).

3. I enjoyed the application for my national ID and e-passport (Tsahkna 2013).

4. I encourage the formal government institutions to expand their e-government services (Valentina 2004).

5. E-government can reduce travelling long distances to obtain government services (Davies 2015).

The eighth construct is 'e-government is a solution for corruption'; the following instruments were applied to measure it, which were extracted from the literature:

1. I believe e-passport online services helped in fighting corruption (Hanna et al. 2011; Goodwill 2017).

2. The implementation of the e-passport contributed to the reduction of corruption (Goodwill 2017).

In addition, there were general demographic questions asked in the questionnaire which are not included in the Figure 5-2.

Table 5-2: Questionnaire instruments

Instrument Items	Sources
Poor Infrastructure Construct	
Electrical power cuts	(Mohamed 2017)
Loss of mobile signal	(Etzo and Collender 2010)
Loss of access to the internet	(Mohamed 2017)
Social Collaboration	
Share internet with friends	(Tan 2007; Gerety et al. 2012; Samuel 2016)
Share internet with relatives	
Share internet with neighbours	
Cases of Corruption	
Bribery	(Kim 2014; Dimant and Tosato 2017)
Exploitation of power	(Nazeer and Furuoka 2017)
Fraud	(Ahmed 2017; Nazeer and Furuoka 2017)
Wasta (favouritism) and nepotism	(Ahmed 2017)
Seizure of public properties	(Braun and Clarke 2015)

Multiple employment	(Otar 2014)
Lack of Citizens' Safety	
I am fearful of being kidnapped	(Kimenyi et al. 2014)
I fear for the safety of my possessions and the risk of them being stolen (my car, for example)	
I fear for the physical safety of my family	
I fear being shot	
I must make careful travel plans in advance	
Trust in Internet	
I trust online applications more than face-to-face applications	(Liu et al. 2002; Bélanger and Carter 2008; Mpinganjira 2015; Ben Mansour 2016)
The internet has enough safeguards to make me feel comfortable using it	(Cimmino et al. 2014; Ben Mansour 2016)
I am afraid that applying online might misuse my personal information	(Lee and Rao 2007; Bélanger and Carter 2008; Carter and Weerakkody 2008; Bashir and Madhavaiah 2015; Ben Mansour 2016)
The outputs of online services are accurate	(Liu et al. 2002; Euijin and Tadisina 2007; Wang and Lo 2013)
Trust in Government Institutions	
How much confidence do you have in government?	(Ivanyna et al. 2016; Freire et al. 2014; Morgeson et al. 2011)
How much of the time do you think you can trust the government?	(PEW 2015; Freire et al. 2014)
I think government institutions are trustworthy	(Kolsaker and Lee-Kelley 2008; Jalali and Khorasani 2012; Luna-Reyes and Gil-Garcia 2014)
I respect and trust formal government institutions	(Milakovich 2012)
I believe formal government institutions can provide online services	(Kvasny and Lee 2011; Khamallag et al. 2017)
Trust in E-services	
Using e-government services is a wise idea	(Rabaa'i 2015; Rabaai et al. 2016)
It would be desirable to use e-government services	(Rabaa'i 2015; Rabaai et al. 2016)
I enjoyed the application for my national ID and e-passport	(Tsahkna 2013)

I encourage the formal government institutions to expand their e-government services	(Valentina 2004)
E-government can reduce travelling long distances to obtain government services	(Davies 2015)
E-government as a solution for Corruption	
I believe e-passport online services helped in fighting corruption	(Hanna et al. 2011; HM-Passport-Office and MP 2017)
The implementation of the e-passport contributed to the reduction of corruption	(HM-Passport-Office and MP 2017).

5.5 ***Measurement tools***

Table 5-3 illustrates those measurement tools applied in a form of a questionnaire, with instruments associated of each model construct. They have been treated through recoding and erasing those instruments which have low values less than (0.4) (Sarstedt et al. 2014) which is clearly discussed in chapter six.

Table 5-3: Measurement tools

Indicator	Construct and Related Measurement Questions
	Social Collaboration
Q13.2	Share Internet with friends
Q13.3	Share Internet with relatives
Q13.4	Share Internet with neighbours
	Poor Infrastructure
Q12.1	Electrical Cut-off
Q12.2	Loss of Mobile signal
Q12.3	Loss of access to the Internet
	Cases of Corruption
Q19.1	Bribery
Q19.2	Exploitation of Power
Q19.3	Fraud
Q19.4	Wasta (Favouritism) and nepotism
Q19.5	Seizure of public properties
Q19.6	Multiple Employment
	Lack of Citizens' safety
Q15.1	I am fearful of getting kidnapped
Q15.2	I fear for the safety of my possessions from being theft (my car for example)
Q15.3	I fear for the physical safety of my family
Q15.4	I fear of getting shot
Q15.5	I have to make carful travel plans in advance.
	Trust in Government Institutions
Q17.1	How much confidence do you have in government
Q17.2	How much of the time do you think you can trust the government
Q17.3	I think Government institutions are trustworthy
Q21.5	I respect and trust formal government institutions
Q21.6	I believe formal government institutions can provide online services
	Trust in Internet
Q18.1	I trust online application more than the face-to-face application
Q18.2	The Internet has enough safeguards to make me feel comfortable using it
Q18.4	The outputs of online services are accurate
	Trust in E-services
Q21.1	Using e-government services is a wise idea
Q21.2	It would be desirable to use e-government services
Q21.3	Enjoyed the application for National ID and E-passport
Q21.4	I encourage the formal government institutions to expand their e-government services
Q21.7	E-government can reduce travelling distances to get the government services
	E-Government Solution For Corruption
Q20.1	I believe E-passport online services helped in fighting corruption
Q20.4	The implementation of the E-passport contributed to the reduction of corruption

5.6 ***Pilot study***

According to Collis and Hussey, it is recommended that before the final survey is distributed a pilot study should be carried out for a small sample of the population (Collis and Hussey 2014). The primary aim of this pilot study is to ensure the validity and consistency of the questionnaire instruments. Furthermore, it ensures that the questionnaire is measuring what it has been designed to measure (Collis and Hussey 2014). The pilot study is also necessary to check the Arabic translation of each question for clearness and consistency in meaning in comparison with the original question in English.

This questionnaire was distributed among 30 selected participants. All participants were Libyans, colleagues and researchers who are different in regarding to their area of specialisation and their residency, to diversify the opinions for the sake of constructive comments and feedback.

The results obtained were tested for consistency and validity using the SPSS package. There were several comments regarding some of the instruments, and the feedback was constructive. Most of the points were taken into consideration in the final version of the questionnaire. Some changes and removal of items were made based on the agreed comments advised by the academics and the participants.

5.7 ***Conclusion***

This chapter aimed to provide a closer look at the research model, which was formulated based on the studies previously conducted and discussed in chapter five. The components of the model were discussed separately and then concatenated together to construct the entire model. The hypotheses were introduced and then plotted on the research model. The instruments were then applied in the questionnaire, which were introduced and thoroughly discussed. The pilot study, which was conducted to test the consistency of the questionnaire items, was later discussed. Within this chapter prepares the basis to perform the analysis in the next chapter.

Chapter 6: **Data Analysis and Discussion**

6.1 ***Introduction***

This chapter presents an in-depth data analysis using both SPSS version 23 and Smart PLS version 3.2.7. It is initiated with the survey data collection, the response rate, data reliability and normality tests, and descriptive statistics for the demographic data. Secondly, the PLS-SEM path model assessment, the reliability of data items, and convergent and discriminant validity are then outlined. Thirdly, the structure is assessed by presenting the significance of the inner model, path coefficients, measurements of the predictive validity using the level of R^2 values, Average of R^2 and blindfolding - Q^2. Finally, the findings are presented in the form of a framework using the Average of R^2 approach. This chapter is focusing on answering the RQ3,4, and 5.

6.1.1 Response rate

The questionnaire was designed using Smart Survey https://app.smartsurvey.co.uk/. This is an online package which can be purchased as a licence by months. The researcher utilised the first free month for training and designing the first draft. The first licenced month of the online package was then utilised to finalise and place the survey online as a pilot study. At the end of this month the final survey was published online, which occurred on 29/07/2017. The survey remained online for almost two months.

The primary platform applied to publish the survey link was Facebook. Alongside this participants were targeted using Viber, WhatsApp and emails to inform them of the placement of the survey link online. The invitation for sharing was made in the statement which was used in the first post. This was reposted a second time after two weeks and then again after four weeks. The response rate was successful; the survey reached 975 participants. From the gender perspective, 20% of the participants were female and 80% were male. The frequencies report is in **Table 6-13**.

6.1.2 Missing data and unengaged participants

Before starting an analysis of the data collected, a screening process for missing and outlier data was conducted (Pallant 2016). Hair stated that when missing data exceeds 10% of the whole population it should be removed, as remedies are not recommended in this case (Hair 2010). Hence, the missing, extreme and outlier data was found to be just above 14% of the entire population and 173 records were removed out of 975. The remaining data, comprising 802 records, were approved for analysis. SPSS 23 was applied during the first preparation stage of the data, and some of the variables were recoded and reversed to cope with the trend of the collected data.

6.1.3 Performed Tests

As the questionnaire was published online there was no place for a human to physically explain any difficulties that the participants may face. However,

each item in the instrument was checked to ensure that it could be well understood. Furthermore, the time given for the participants to complete the questionnaire was calculated, to be on average of, ten minutes.

The value of Cronbach's Alpha was measured in this research and recorded as 0.75, which was above the threshold of 0.7 and therefore acceptable. Hair et al. considered the threshold to be over 0.7, and considered that the threshold level can be accepted even if it is above 0.6 for exploratory studies (J. F. Hair et al. 2014). This issue was introduced in chapter three, in detail.

6.2 ***Normality test***

It has been found that if an issue exists related to the skewness and kurtosis (higher than +1 or less than -1), then the data is not normally distributed (J. Hair et al. 2014). This research applied both criteria to ensure that the data was not normally distributed to fulfil the PLS-SEM requirements and prevent any bias, to ensure the results from being affected. The tables in appendix (D) illustrate this issue.

The model was designed, firstly, to examine the interrelationships between the chaotic environment related constructs. Secondly, deployment of the PLS approach was utilised to start the evaluation of the measurement and structural models using Smart-PLS software package Version (3.2.7). The path coefficient and the level of significance were calculated using a

bootstrapping procedure with 5,000 regenerated samples (Joe F. Hair et al. 2011). The bootstrapping approach technique uses randomly generated samples to estimate the standard errors and confidence intervals of the complex parameters of the distributions.

6.3 *Construct reliability*

Table 6-1 illustrates the Cronbach Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) where all the values are >0.7, >0.7, and >0.50, respectively.

Table 6-1: Construct reliability and validity

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Cases of corruption	0.901	0.924	0.669
E-government solution for corruption	0.734	0.882	0.790
Lack of personal safety	0.888	0.922	0.748
Poor infrastructure	0.770	0.867	0.685
Social collaboration	0.789	0.876	0.703
Trust in e-services	0.835	0.884	0.605
Trust in government institutions	0.819	0.872	0.577
Trust in internet	0.722	0.843	0.642

6.4 ***Cross-loadings & discriminant validity***

Chin et al. (1998) defined the cross-loadings as the loadings of each item indicator, which should be higher than all of the other indicator loadings. As illustrated in

Table 6-3 the value of the loadings of each indicator, which are highlighted in bold, are greater than the other cross-loadings in the same indicator. This indicates that the discriminant validity requirements have been achieved in this case. The comparison of cross-loadings and the Fornell-Larcker criteria revealed that the model constructs were discriminant. The values shown in the diagonal of Table 6-2 are the result of the comparison of the square root of AVE with the correlation of the latent variable based on Fornell-Larcker criteria (Joseph Hair et al. 2012; Henseler et al. 2014; Rasoolimanesh et al. 2017).

Table 6-2: The comparison of the square root of AVE with the correlation of the latent variable based on Fornell-Larcker criteria

	Cases of corruption	E-government solution for corruption	Lack of personal Safety	Poor infrastructure	Social collaboration	Trust in e-services	Trust in government institutions	Trust in internet
Cases of corruption	0.818							
E-government solution for corruption	-0.069	0.889						
Lack of personal safety	0.238	-0.114	0.865					
Poor infrastructure	0.26	-0.151	0.246	0.827				
Social collaboration	0.08	0.03	0.172	0.164	0.838			
Trust in e-services	0.02	0.506	-0.141	-0.119	-0.028	0.778		
Trust in government institutions' commitment	-0.164	0.405	-0.133	-0.181	0.068	0.39	0.759	
Trust in internet	-0.035	0.302	-0.032	-0.107	-0.035	0.417	0.288	0.801

Table 6-3: Constructs indicators and cross-loadings

	Cases of Corruption	E-gov Solution for corruption	Lack of Personal Safety	Poor Infrastructure	Social Collaboration	Trust in E-services	Trust in Government Institutions	Trust in Internet
Q12.1R	0.218	-0.066	0.183	0.772	0.111	-0.073	-0.138	-0.076
Q12.2R	0.201	-0.147	0.191	0.849	0.137	-0.096	-0.151	-0.091
Q12.3R	0.226	-0.155	0.232	0.859	0.156	-0.121	-0.155	-0.098
Q13.2R	0.086	0.012	0.161	0.172	0.898	-0.006	0.060	-0.009
Q13.3R	0.070	0.010	0.098	0.136	0.804	-0.042	0.039	-0.021
Q13.4R	0.043	0.053	0.164	0.101	0.809	-0.031	0.070	-0.060
Q15.1R	0.190	-0.109	0.828	0.178	0.115	-0.130	-0.107	-0.018
Q15.2R	0.181	-0.088	0.880	0.213	0.150	-0.104	-0.132	-0.031
Q15.3R	0.199	-0.115	0.870	0.242	0.159	-0.162	-0.146	-0.062
Q15.4R	0.250	-0.083	0.880	0.213	0.164	-0.090	-0.072	0.002
Q17.1R	-0.140	0.255	-0.110	-0.188	0.032	0.162	0.783	0.176
Q17.2R	-0.167	0.256	-0.140	-0.172	0.059	0.192	0.785	0.199
Q17.3R	-0.181	0.260	-0.139	-0.194	0.018	0.189	0.786	0.222
Q18.1	-0.019	0.224	-0.018	-0.090	-0.057	0.342	0.216	0.821
Q18.2	-0.023	0.208	-0.047	-0.078	-0.005	0.302	0.238	0.825

Q18.4	-0.041	0.285	-0.014	-0.090	-0.022	0.351	0.241	0.758
Q19.1R	0.780	-0.040	0.262	0.217	0.102	-0.014	-0.114	-0.019
Q19.2R	0.877	-0.045	0.206	0.213	0.039	0.049	-0.159	-0.014
Q19.3R	0.851	-0.085	0.246	0.238	0.097	-0.032	-0.114	-0.078
Q19.4R	0.797	-0.056	0.149	0.218	0.042	0.064	-0.188	0.011
Q19.5R	0.826	-0.055	0.161	0.206	0.042	0.022	-0.136	-0.050
Q19.6R	0.769	-0.058	0.096	0.169	0.062	0.022	-0.073	-0.014
Q20.1	-0.055	0.891	-0.105	-0.149	0.027	0.442	0.376	0.288
Q20.4	-0.068	0.887	-0.098	-0.121	0.026	0.457	0.347	0.245
Q21.1	0.050	0.399	-0.116	-0.095	-0.069	0.843	0.271	0.371
Q21.2	0.066	0.380	-0.104	-0.073	-0.022	0.829	0.215	0.329
Q21.3	-0.071	0.449	-0.074	-0.132	-0.024	0.685	0.403	0.306
Q21.4	0.047	0.383	-0.139	-0.075	0.016	0.808	0.286	0.303
Q21.5	-0.104	0.382	-0.071	-0.122	0.075	0.407	0.741	0.190
Q21.6	-0.055	0.328	-0.062	-0.041	0.058	0.422	0.688	0.280
Q21.7	0	0.332	-0.117	-0.076	-0.007	0.714	0.333	0.296

6.5 *Data analysis for each model construct*

6.5.1 Lack of citizens' safety

The first issue that the participants expressed their concern in was the lack of citizens' safety that was the "fear of being kidnapped". Eighty-seven participants, that represent just over 10% of the population, expressed their fear of kidnapping as being both "always" and "very often", while there were 112 participants, 14% of the sample population, who expressed their concern as being "sometimes". The total number of participants who had a concern about being kidnapped were 199, which represented around 25% of the population.

The second concern was the "fear of their possessions being stolen". In this regard, 230 participants expressed their level of concern as being "always" and "very often" and 204 participants expressed it as being "sometimes". In total, 434 participants responded, representing approximately 54% of the total sample.

The third concern was "fear for the physical safety of my family". There were 322 participants who expressed concern about their family members' physical safety at levels of "always" and "very often", whereas 154 participants expressed their fear as being "sometimes". The total percentage represented almost 60% of the population.

The fourth concern was the “fear of being shot”. There were 121 participants who expressed a real fear of being shot as “always” and “very often”, whereas 131 expressed it as “sometimes”. The total percentage for this concern was about 31% of the total population.

Finally, the majority of the participants represented those that who stated they “make careful travel plans in advance”. The total number of participants that expressed their attitude by stating that they “always” and “very often” calculated to 519, and 141 expressed their opinion as “sometimes”. About 82% of the total population, 660 out of 802 participants, were concerned about making solid travel plans before their travel.

The concerns as mentioned above have cast a shadow on the entire process. Citizens attempted different ways through using informal procedures to obtain e-services.

6.5.2 Cases of corruption

Cases of corruption experienced by citizens who expressed answers of “always”, “very often” and “sometimes” are illustrated in the following table. The data extracted from the SPSS output where the sample response was answered by both “rarely” and “never” were ignored.

From Table 6-4, it is clear that over 50% of participants frequently experienced an activity from the list of corruption situations, while around 25% sometimes

faced the same situations. About 75% of the population have noticed situations of corruption. This reflects the chaotic environment that the country is facing and the effort needed to control this high level of corruption is worthy of further study by the government.

Table 6-4: Experienced corruption cases by participants

Cases of corruption	Always & Very Often	%	Sometimes	%	Total %
Bribery	259	32.29	227	28.30	60.60
Exploitation of power	482	60.10	184	22.94	83.04
Fraud	307	38.28	225	28.05	66.33
Wasta (favouritism) and nepotism	605	75.44	114	14.21	89.65
Seizure of public properties	446	55.61	186	23.19	78.80
Multiple employment	365	45.51	241	30.05	75.56

6.5.3 Citizens' social collaboration

Table 6-5 was extracted from the SPSS frequency report regarding the social collaboration measurement indicators. It shows that just over 40% of the population sample had utilised the spirit of collaboration between citizens, which was represented in sharing internet accessibility.

Table 6-5: Frequency report for social collaboration measurement indicators

Citizens' Social Collaboration	**Always & Very Often**	**%**	**Sometimes**	**%**	**Total %**
Share internet with friends	131	16.3	232	28.9	45.2
Share internet with relatives	153	19.1	215	26.8	45.9
Share internet with neighbours	60	7.4	111	13.8	21.2

This result indicated that with regard to trust and friendship, sharing the internet is useful (Cao et al. 2015). There is a trend towards this type of

collaboration during stable situations and even more so in chaotic environments where the need for this type of collaboration is essential.

6.5.4 Poor infrastructure

It is clear from Table 6-6 that the country's infrastructure has deteriorated, which was reflected in the participants' answers during their interviews, as discussed in chapter five. The infrastructure of electricity and communications had been severely damaged by the conflict and war since 2011, and it was already in a poor state, even before the revolt, according to the UN e-readiness report (Ayanso et al. 2011). If the first two answers out of the five scales are taken, then the result shows that approximately 30% are suffering from the loss of a mobile signal and nearly 30% are suffering from the loss of internet access. On the other hand, almost 60% are suffering from electricity power cuts, which at the same time also affects the other activities. The percentage increased by almost 30% if the "sometimes" (neutral) answer is also included. Based on Sturgis et al. (2014), the middle answer is considered as a "*face-saving don't know*", or avoiding social embracement (Sturgis et al. 2014). Hence, in this research study this answer has been ignored and focused on both sides of the answers.

Table 6-6: Frequency report for poor infrastructure construct

Poor infrastructure	Always & Very Often	%	Sometimes	%	Total %
Electricity power cuts	489	61.0	246	30.7	91.7
Loss of mobile signal	257	32.0	392	48.9	80.9

Loss of access to the internet	238	29.7	426	53.1	82.8

6.6 *The formal and informal institutional model: bootstrapping – 5,000*

The results of the model bootstrapped with 5,000 iterations is shown in Figure 6-1 shown below:

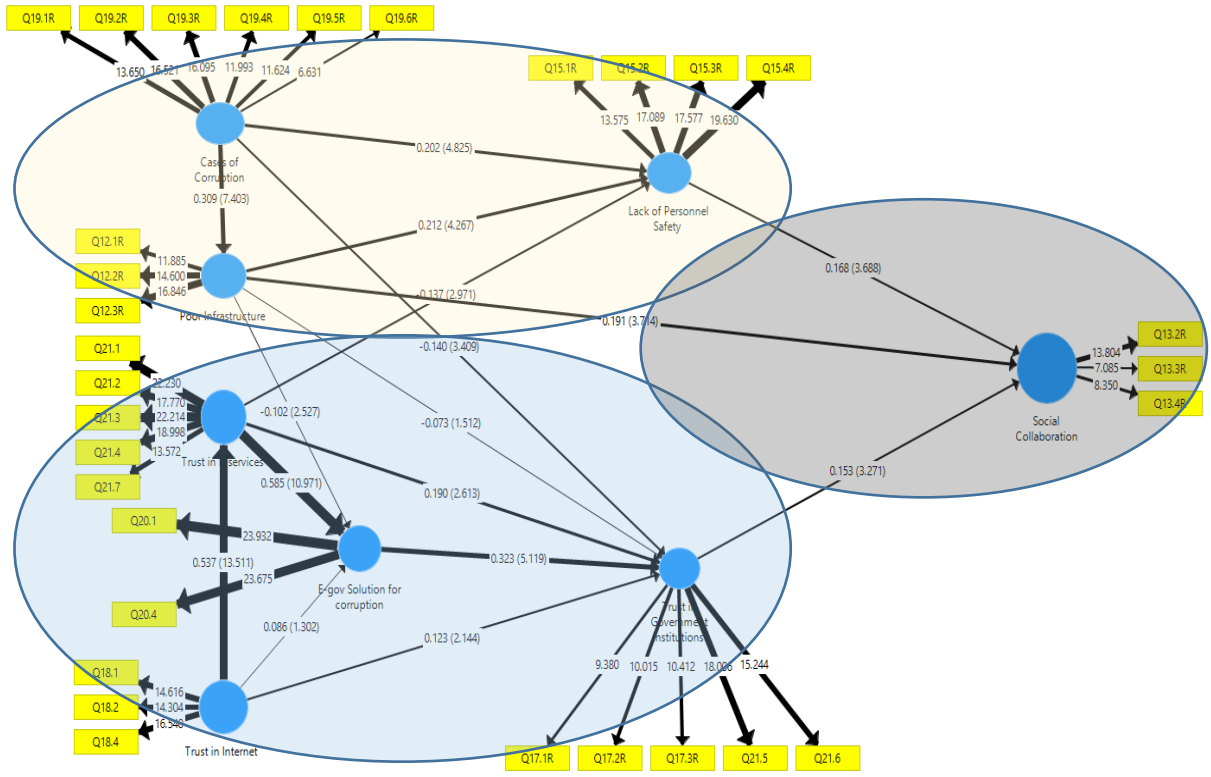

Figure 6-1: SmartPLS Bootstrapping result

6.6.1 Hypotheses significance table

From both Figure 6-1 and Table 6-7 it can be concluded that there are two hypotheses, H3 and H11, which are not supported as their T-values are 1.503 and 1.309, respectively, which are less than 1.96. The other hypotheses were

supported and therefore can be accepted. Hence, in this case, a null hypothesis has to be accepted for those two hypotheses. With regard to H11, as posited by Subhash, the role of e-government in fighting corruption is "incidental and not part of design objectives" (Subhash 2005, p.21). Hence, H11, that linked the trust in the internet construct with the e-government solution for corruption construct, was not supported, as it was a result of implementation and was not necessary to have this relationship with trust in the internet.

Table 6-7: Hypotheses significance table

	Relationship	Path-Coeff	T-Value
H1	Lack of personal safety -> Social collaboration	0.168	3.584
H2	Poor infrastructure -> Social collaboration	0.191	3.701
H3	Poor infrastructure -> Trust in government institutions' commitment	-0.073	1.503
H4	Poor infrastructure -> E-gov solution for corruption	-0.102	2.558
H5	Cases of corruption -> Lack of personal safety	0.202	4.894
H6	Cases of corruption -> Trust in government institutions' commitment	-0.140	3.420
H7	Cases of corruption -> Poor infrastructure	0.309	7.617
H8	Poor infrastructure -> Lack of personal safety	0.212	4.301
H9	Trust in government institutions' commitment -> Social collaboration	0.153	3.331
H10	Trust in internet -> Trust in government institutions' commitment	0.123	2.169
H11	Trust in internet -> E-gov solution for corruption	0.086	1.309
H12	Trust in internet -> Trust in e-services	0.537	13.483
H13	Trust in e-services -> Lack of personal safety	-0.137	2.982
H14	Trust in e-services -> Trust in government Institutions' commitment	0.190	2.606
H15	Trust in e-services -> E-gov solution for corruption	0.585	11.094
H16	E-gov solution for corruption -> Trust in government institutions' commitment	0.323	5.136

6.7 *Chaotic situation related factors*

6.7.1 Cases of corruption construct

The cases of corruption construct is an exogenous variable which reflects that the real cases experienced by the participants during the current chaotic situation have significant positive relationships with the poor infrastructure construct, where H7= (Path Coefficient=0.309, T-value=7.617). These indicate that, in addition to the consequences of civil war, the corruption experienced by citizens within the government institutions led to the current deterioration of the country's infrastructure.

The cases of corruption construct also has a significant positive relationship with the lack of citizens' safety, where H5= (Path Coefficient=0.202, T-value=4.894). The result indicates that the cases of corruption experienced by citizens have an impact on public safety (Kääriäinen 2009).

Cases of corruption have a significant adverse weak relationship with the trust in government and institutions' commitment, where H6 = (Path Coefficient=0.140, T-value=3.420). This relationship was found to be compatible with the study (Kääriäinen 2009) which linked the government and institutions' commitment represented by the police sector and cases of corruption. This shows the impact of the level of corruption on the trust in government and institutions' commitment, especially in a chaotic environment (Kääriäinen 2009). Citizens who experienced cases of corruption felt less able

to trust the government institutions, which had an impact on their intention to use the services offered and delivered online.

6.7.2 Poor infrastructure construct

From the model, it is evident that the poor infrastructure has a significant weak relationship with the social collaboration construct, where H2= (Path Coefficient=0.191, T-value=3.701). The deterioration of infrastructure in certain cities had forced citizens to use their relatives, kinship, colleagues and friends in other cities to apply for their e-passports. It also had a strong relationship with the lack of citizens' safety, where H8 = (Path Coefficient=0.212, T-value=4.301). This relationship was positive, which indicated that one of the reasons concerning the lack of citizens' safety was the lack of communications and the overcrowding on the roads and the places where services were delivered. Conversely, the deterioration of the infrastructure had no impact on the trust, which meant it was an insignificant relationship, where H3 = (Path Coefficient=-.073, T-value=1.503) where the t-value was less than 1.96. Infrastructure was the backbone of all services. Hence, government and institutions' commitment had utilised the existing infrastructure to implement the e-passport process with the limited and unstable communication and electrical networks. H3 was not supported on this occasion, which indicated that citizens did not blame the government for the existing poor infrastructure.

Similarly, poor infrastructure had a weak negative relationship with the e-government solution for corruption construct, where H4 = (Path Coefficient= -.102, T-value= 2.558). This meant the poor infrastructure negatively impacted on the primary goal of e-government implementation in fighting corruption.

6.7.3 Lack of citizens' safety

As a result of the chaotic environment, citizens experienced fears in their daily lives and work. This forced them to create some social networks. By using their connections, people aided each other in different ways, including sharing their internet access to use the e-services offered. The relationship between the lack of citizens' safety construct and the social collaboration construct, which is represented by H1, was found to be significant, where H1 = (Path Coefficient=0.168, T-value=3.584). This relationship can be interpreted, as the social collaboration can reduce the impact of the chaotic environment by reducing the chances of risk that the citizens face. Although the relationship is weak, it is significant and worth considering this influence during chaotic situations. It also confirms and proves the previous claim of Barrenechea and Jenkins that e-government minimises threats among citizens and improves their safety and security as a result of its mobility (Barrenechea and Jenkins 2014).

The first three constructs: poor infrastructure, cases of corruption and lack of citizens' safety represent the chaotic environment which had overcome the

spirit of social collaboration among citizens to use the mandatory e-services offered. Hence, during the chaotic environment, social collaboration could be considered as the lifeline for citizens to protect themselves against conflict.

6.8 *Government institutions related factors*

6.8.1 Trust in the internet

This is an exogenous variable which started without any previous relationship. Trust in the internet was found to be significantly related to trust in government institutions and this supported H10, where H10= (Path Coefficient=0.123, T-value=2.169). Trust is the critical point to encourage citizens to work together and use the e-services offered. Hence, it was found to be one of the ingredients that should be tested in this model and was found to be significant, regardless of the strength of this significance, as the situation in which the study was conducted is not normal.

On the other hand, trust in the internet is significantly related to trust in e-services, which is shown as H12= (Path Coefficient=0.537, T-value=13.483). It is a strong positive relationship and closes the triangle of trustworthiness. The trust in the internet construct plays a significant role in this model, because the internet is the platform for any e-services.

6.8.2 Trust in e-services

This is an indigenous variable and is strongly related to the e-government solution for corruption construct, where H15= (Path Coefficient = 0.585, T-value=11.094). This relationship confirms the previous studies (Shim and Eom 2008; Srivastava et al. 2016; Sheryazdanova and Butterfield 2017) with the added value that this research is related to chaotic environments and thus enriches the literature in this context.

The trust in e-services construct has a significant positive relationship with the trust in government institutions construct, which supports H14 = (Path Coefficient = 0.190, T-value = 2.606). This relationship closes the trustworthiness triangle, which formulates the formal institution component. Trustworthiness is the backbone for any government to work side-by-side with the public to ensure the delivery of services in normal situations (Smith 2010; Anthopoulos et al. 2016; Stoyan et al. 2016; Lallmahomed et al. 2017; Porumbescu 2016), and this is more important in a chaotic environment.

There is a significant negative relationship between the trust in e-services and the lack of citizens' safety constructs, whereby H13 = (Path Coefficient = -0.137, T-value = 2.982). This relationship indicates that trust in e-government services can improve the citizens' safety in a chaotic environment, which reflects the opinions of the citizens who are living in conflict and unstable conditions. Furthermore, it has been posited by Mcknight et al., that the

implementation of e-services has the potential to improve the citizens' safety environment (Mcknight et al. 2002). Hence, implementing e-government will improve the well-being of citizens in normal situations and in non-normal situations it is a priority.

6.8.3 E-government as a solution for corruption

This construct supports the trust in government, whereby the participants are aware of the role of e-services in curbing corruption. Hence, there is a supportive, positive relationship with trust in government institutions, where H16= (Path Coefficient=0.323, T-value= 5.136). This relation has strengthened the trust in government institution construct to face the rampant corruption as a result of the chaotic situation. Although there is a lack of resources, security and stability, the government institution that is responsible for the e-passport process has succeeded, to a certain extent, in achieving its implementation online.

6.8.4 Trust in government and institutions' commitment

This construct formulates the formal institution component which was found to have a significant relationship with the social collaboration construct, whereby H9 is supported and recorded with (Path Coefficient = 0.153, T-value = 3.331). The real trust in government institutions and their commitment encouraged citizens to use the e-passport system offered, applying all possible means.

This relationship also confirms the previous finding (Mcknight et al. 2002), in addition to superimposing this study on the chaotic environment.

This relationship links both formal and informal institutions together to form a model that could be useful and worthy of focus during chaotic environments. The existing fragmented formal institutions can use the available resources, such as the limited deteriorated infrastructure, and ignore the existing cases of corruption, and can work hard to implement the necessary e-services. Those urgent e-services can be accessed by traumatised citizens using the spirit of sharing and collaboration among themselves.

6.9 *Social collaboration related factors*

6.9.1 Citizens' social collaboration

This factor is the final indigenous construct which has no output. Hence, it has a significant relationship with the exogenous variables or the independent variables (Poor infrastructure, H2; lack of citizens' safety, H1 and trust in government institutions' commitment, H9), which together formulates the model of e-government implementation in a chaotic environment. The reflection which is shown from both dimensions, government and chaotic situations, towards using the e-passport system during this environment shows that social collaboration played a vital role in this process.

6.10 ***Summary of hypotheses***

Table 6-8: Summary of the hypotheses

	Hypotheses Statements	Results
H1	Lack of citizens' safety directly impacts on social collaboration	Supported
H2	Poor infrastructure forces citizens to apply for e-passports using their social connections	Supported
H3	Poor infrastructure negatively impacts on trust in government institutions	Not Supported
H4	Poor infrastructure negatively impacts on e-government as a solution to corruption	Supported
H5	Cases of corruption directly impacted on citizens' safety in the chaotic environment	Supported
H6	Cases of corruption negatively impacted on trust in government institutions	Supported
H7	Cases of corruption impact directly on the poor infrastructure	Supported
H8	Poor infrastructure has a relation with lack of citizens' safety	Supported
H9	The trust in government institutions and their commitment encouraged citizens to use the e-passport through social collaboration	Supported
H10	Trust in the internet positively impacts on trust in government institutions and their commitment	Supported
H11	Trust in the internet is related to the e-government solution for corruption	Not Supported
H12	Trust in the internet is strongly related to trust in e-services	Supported
H13	Trust in e-services can improve citizens' safety	Supported
H14	Trust in e-services leads directly to trust in government institutions and their commitment	Supported
H15	Trust in e-services leads to realising e-government as a solution for corruption	Supported
H16	E-government as a solution for corruption positively contributes to trust in government and institutions' commitment	Supported

6.10.1 Measuring predictive validity

There are several statistical assumptions that should be conducted to measure the predictive validity of any model. The most famous method is by calculating the coefficient of determination – R^2 values, which should be higher than 0.02. The Stone-Geisser's value, which is known as the Q^2 Coefficient, is then computed, which should result higher than 0.0. Finally, calculating the

Variance Inflation Factor estimation (VIF) should be undertaken to check the multicollinearity of the model, which should calculate above 0.1 but less than 5.0 (Hair et al. 2017; Henseler et al. 2014; SmartPLS-GmbH 2017). The following sections apply these statistical tests to the research data.

6.10.1.1 The significance of the Coefficient of Determination - R^2

The Coefficient of Determination or R^2 indicates how well all of the independent variables explain the dependent variables. It represents the level of explanation provided to the dependent from the independent variables. From the study model, as an example, it indicates how the social collaboration construct is explained by the lack of safety construct or the poor infrastructure construct. Different scholars have put forward different opinions and views as to what constitutes R^2. In the following sections, an introduction to each scholar and their claims is illustrated.

Cohen (1992) suggested that the value of R^2 for the endogenous latent variables are: 0.02, 0.13, and 0.26 which are small, medium and large effect size, respectively.

Falk and Miller (1992) suggested that the value of R^2 for the endogenous latent variables should be equal to or greater than 0.1 to explain the variance of a specific endogenous construct to be deemed adequate. Chin (1998) claimed that R^2 values for the endogenous latent variables are assessed as follows:

0.19, 0.33, and 0.67. Hair et al. (2011) suggested the following values as a rule of thumb: 0.25, 0.50, and 0.75. Table 6-9 illustrates all of these views.

Table 6-9: R Squared Interpretation according to different scholars

R^2 Value				Interpretation
(Cohen 1992)	(Falk and Miller 1992)	(Chin 1998)	(Joe F; Hair et al. 2011)	
0.02	**>=0.1**	**0.19**	**0.25**	Small effect size or (weak)
0.13		**0.33**	**0.50**	Medium effect size or (moderate)
0.26		**0.19**	**0.75**	Large effect size or (substantial)

In this research, the threshold of R^2 adopted was a value higher than 0.02, based on the expert's recommendation (Cohen 1992).

6.10.1.2 Measuring predictive validity - Q^2

In SmartPLS, this test is called a blindfolding test, which is a sample re-use technique to calculate Q^2 – Stone-Geisser's value (SmartPLS-GmbH 2017; J. Hair et al. 2014) in order to check the predictive relevance of the PLS path model and known as Q^2. If the value of Q^2 is greater than zero that meant that the model is predictive for the given endogenous variables (Streukens and Leroi-Werelds 2016; Henseler et al. 2016; Hair et al. 2017; SmartPLS-GmbH 2017). However, the model will be irrelevant if the value of Q^2 is negative for the given dependent factors. Table 6-10 below illustrates the result of the blindfolding test Q^2.

Table 6-10: Blindfolding test result - Q Square

	SSO	SSE	Q^2 (=1-SSE/SSO)
Cases of corruption	4,812.00	4,812.00	
E-government solution for corruption	1,604.00	1,287.46	0.197
Lack of personal safety	3,208.00	2,970.23	0.074
Poor infrastructure	2,406.00	2,302.72	0.043
Social collaboration	2,406.00	2,318.46	0.036
Trust in e-services	4,010.00	3,621.27	0.097
Trust in government institutions	4,010.00	3,528.91	0.120
Trust in internet	2,406.00	2,406.00	

It is clear that the table indicates the final model is predictive and all the related independent constructs are predicting the dependent ones.

6.10.1.3 Variance Inflation Factor test (VIF)

The degree to which the independent constructs are highly correlated with one another is called multicollinearity (Hair 2010). The multicollinearity can be considered if the outer loadings of the items are either negative values or VIF is above 10.0 (Hair 2010). The collinearity statistics, or as it is known, variance inflation factor (VIF) was applied in this research study. It is illustrated in the Table 6-11. In this study, all the VIF values were below 5.0. This indicates that the model is acceptable and there is no indication of multicollinearity (Henseler et al. 2016; J. Hair et al. 2014; Rasoolimanesh et al. 2017).

Table 6-11: Variance Inflation Factor (VIF)

Outer items	VIF	Outer items	VIF
Q12.1R	1.433	Q19.1R	1.986
Q12.2R	1.739	Q19.2R	3.108
Q12.3R	1.661	Q19.3R	2.562
Q13.2R	2.006	Q19.4R	2.421

Q13.3R	1.724	Q19.5R	2.535
Q13.4R	1.512	Q19.6R	2.175
Q15.1R	2.204	Q20.1	1.505
Q15.2R	2.779	Q20.4	1.505
Q15.3R	2.539	Q21.1	2.462
Q15.4R	2.565	Q21.2	2.447
Q17.1R	3.437	Q21.3	1.297
Q17.2R	3.574	Q21.4	2.004
Q17.3R	2.349	Q21.5	1.431
Q18.1	1.625	Q21.6	1.342
Q18.2	1.670	Q21.7	1.483
Q18.4	1.242		

6.10.2 The significance of the inner model

A bootstrapping procedure with 5,000 regenerated samples was run to find the inner model level of significance. Two-tailed t-values with a significance level of 5% were used. From Table 6-12, it was clear that all the linkages were statistically significant, and the t-values recorded were above 1.96.

Table 6-12: The significance of the inner model

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Cases of corruption -> Lack of personal safety	0.194	0.195	0.036	5.381	0.000
Cases of corruption -> Poor infrastructure	0.260	0.262	0.036	7.323	0.000
Cases of corruption -> Trust in government institutions	-0.129	-0.130	0.034	3.810	0.000
E-gov solution for corruption -> Trust in government institutions	0.243	0.243	0.035	6.862	0.000
Lack of personal safety -> Social collaboration	0.150	0.152	0.038	3.960	0.000
Poor infrastructure -> E-gov solution for corruption	-0.086	-0.087	0.030	2.861	0.004
Poor infrastructure -> Lack of personal Safety	0.181	0.182	0.039	4.657	0.000

Poor infrastructure -> Social collaboration	0.148	0.150	0.039	3.824	0.000
Poor infrastructure -> Trust in government institutions	-0.073	-0.073	0.036	2.010	0.044
Trust in e-services -> E-gov solution for corruption	0.452	0.454	0.033	13.500	0.000
Trust in e-services -> Lack of personal safety	-0.123	-0.124	0.039	3.204	0.001
Trust in e-services -> Trust in government institutions	0.214	0.214	0.042	5.045	0.000
Trust in government institutions -> Social collaboration	0.115	0.116	0.037	3.084	0.002
Trust in internet -> E-gov solution for corruption	0.104	0.103	0.040	2.614	0.009
Trust in internet -> Trust in e-services	0.417	0.418	0.032	13.175	0.000
Trust in internet -> Trust in government institutions	0.114	0.114	0.037	3.052	0.002

6.11 ***Discussion***

A chaotic situation, which can be described by the lack of citizens' safety, corruption, and poor infrastructure, is an atmosphere that could lead to a failure of any e-government initiatives. Predicting what will happen in a chaotic situation is difficult. When a country loses the potential to recover following riots, conflict and civil war, there must be a survival mechanism to begin maintaining the damaged and missing institutions. Discussing the role of formal or informal institutions is sometimes meaningless in a situation where citizens are traumatised to the extent that "reaching home safely is in itself a success" (participant answer in the pilot study interview). Others said "crossing a road inside the city centre with the existence of snipers is like being given another chance of life". When we come to analyse this situation from the perspectives of implementing and using e-services, it is difficult to follow the ideal status of the analysis methodology. The focus was placed on the real,

existent situation and the type of e-services offered. The reasons for offering these services and how citizens have applied them, was studied. The aim was to study a success story and incorporate it into a roadmap for government institutions to implement other e-government services.

The related institutions were able to implement the e-passport process because it began just before the riots in 2011 and the plan was ready to implement (Ministry of Foreign Affairs 2014; Khamallag et al. 2016). When the country entered into that situation, everything was put on hold whilst waiting for stability. The e-passport and National Identity Number (NID) scheme were implemented despite the situation in the country (Identityfeed.com 2016; Libya-Herald 2013; Ministry of Foreign Affairs 2014).

Government institutions could overcome the consequences of a chaotic situation by encouraging citizens to collaborate with each other using their social connections. This encouragement can be facilitated through legislation and the influence of offices and personnel within the service departments upon citizens.

6.12 ***The model after removing H3 and H11***

After removing those hypotheses which were not supported, represented in H3 and H11, the new model was formed, as shown in Figure 6-2.

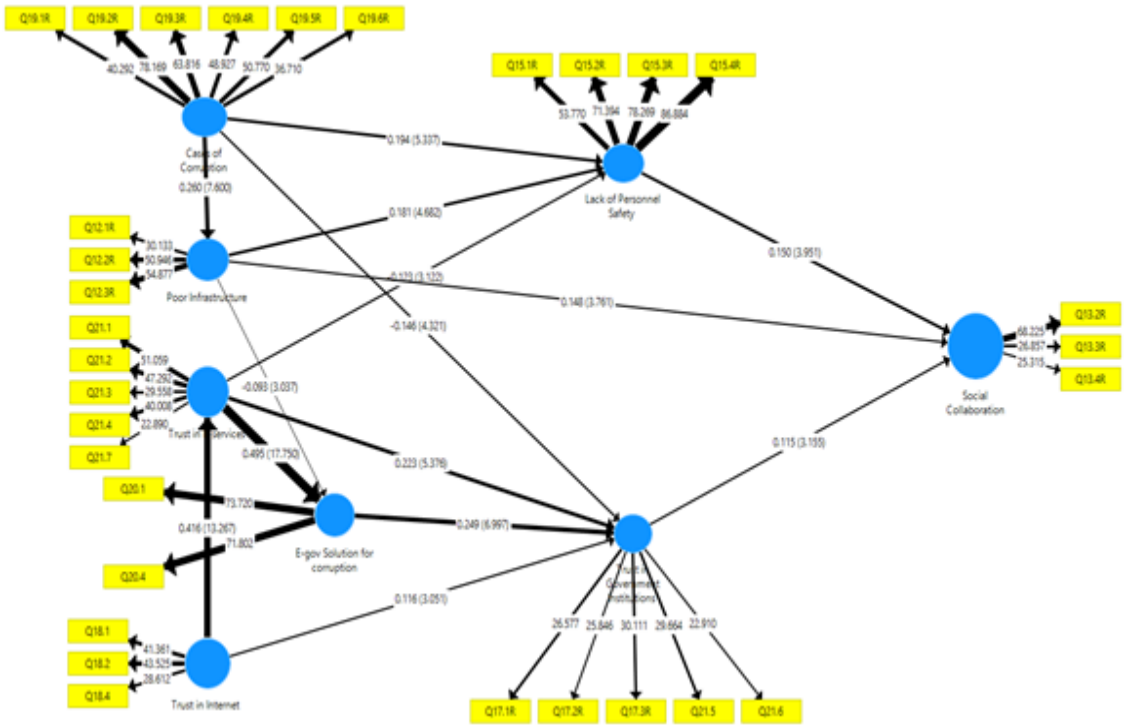

Figure 6-2: Final Model

6.13 *The influence of demographic factors as a moderation effect*

6.13.1 Demographic output data

Table 6-13 illustrates the frequency of collected data based on gender, age, education level, work experience, and internet access media. Mainly, to classify the collected data based on age, gender, education, experience, and internet accessibility.

Table 6-13: Demographic data

		Category	Frequency	%
1.	Gender	Male	642	80

		Female	160	20
2.	Age	Below 30	185	23
		31-40	249	31
		41-50	238	30
		Over 50	130	16
3.	Education Level	Diploma or Below	175	22
		BSc or equivalent	237	30
		Postgraduate	382	48
4.	Work Experience	- 10 years	392	49
		11 - 20	228	28
		+ 21	182	23
5.	Internet Access Through	Computers Only	98	12
		IPad, Tablets or others.	160	20
		Mobile & Computers	440	55
		Mobile Only	215	27

6.13.2 Data collected from Libyan cities

The questionnaires were published and shared online using the Facebook social media platform. The number of shares among friends was very successful. The sharing process resulted in the number of participants reaching 975 within a few weeks. Demographically, after the researcher had published the survey online, there was no control over the participants' location. The records show that the participants represented most of the main cities in the state of Libya. The first three major cities represented the highest number of participants. Figure 6-3 illustrates the pie chart which represents all of the hometowns of the participants on the basis of a percentage for each city.

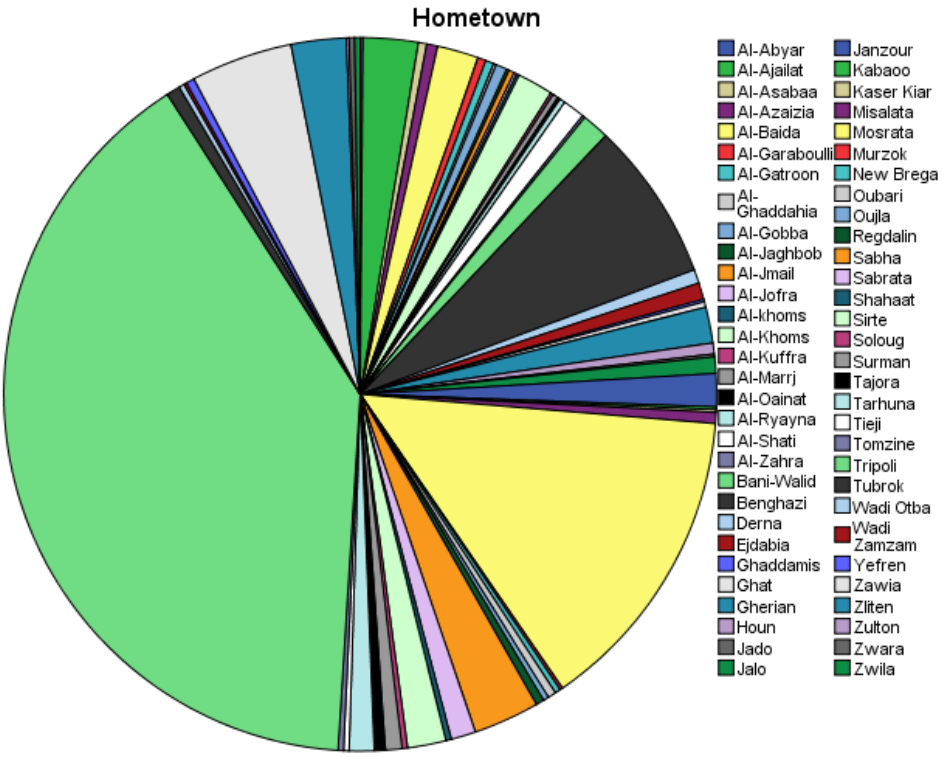

Figure 6-3: The main cities participated in data Collection

Figure 6-4 illustrates the participants distributed on the Libyan map, where the blue circles represent the number of participants. The pie chart in Figure 6-3 and the map in Figure 6-4 show that the majority of participants were recorded from the main cities and towns; for example Tripoli (the capital), Misrata, Benghazi, Zawia, Sabha, Zliten and Al-Ajailat, while the number of participants from the rest of the cities and towns ranges from one to six participants.

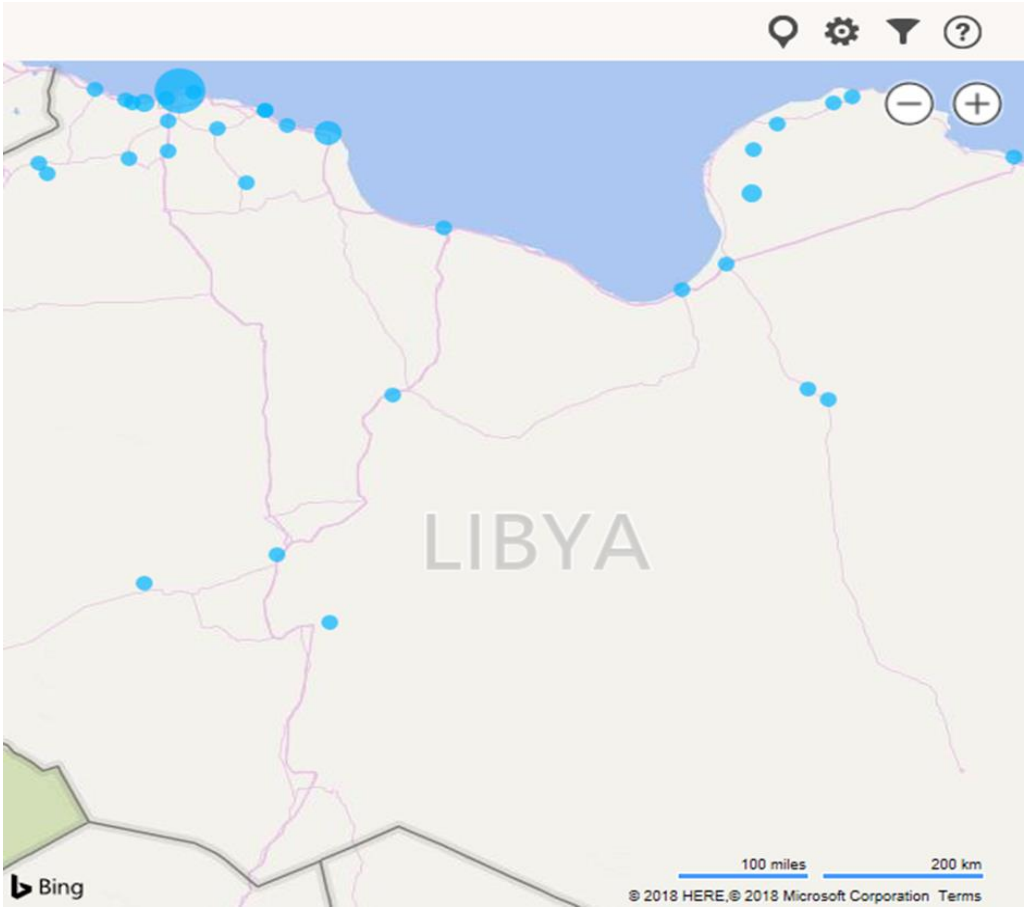

Figure 6-4: Libyan map illustrates the major cities contributed in data collection

6.13.3 Internet access using computers only

Participants who access the internet through computers show that there is a significant relationship between cases of corruption and lack of citizens' safety. It can be interpreted that corruption cases lead to increased risks on citizens. Hence, their safety are at stake. This meant citizens would worry about being in face-to-face situations, as they will have to travel and wait for a long time, which can be a challenging situation.

- Trust in e-services shows a significant negative relationship with the lack of citizens' safety factor, which reflects the previous relationship. E-services have an impact on the lack of citizens' safety by reducing the risk.

- Citizens, through collaboration, used the e-passport system and helped each other to access the e-services.

It can be concluded that people are willing to help, especially those who understand how to access computers and are able to obtain internet access. This spirit of collaboration is beneficial and can be utilised by the limited existing formal institutions in order to implement e-services. Hence, they can rely, to a certain extent, on the social collaboration to ensure e-services are delivered and used.

6.13.4 Internet access through mobile only

Poor infrastructure still impacts on the lack of citizens' safety, even for citizens who use mobiles to access the internet. However, this makes their social collaboration easier through sharing the internet and improves the level of trust in e-government institutions which provide the e-services.

On the other hand, the participants who accessed the internet and e-services through their handsets had the mobility and the ability to increase their e-services adoption and usage. This mobility is significant for the efficiency of

social collaboration during chaotic environments. Table 6-14 below illustrates the cross-tabs results for applying both technologies.

Table 6-14: Cross Tabulation result

Mobile Phones * Computers Cross-tabulation

Count

		Computers		
		0	1	Total
Mobile Phones	0	20	98	118
	Mobile Phones	244	440	684
Total		264	538	802

Of the survey participants, 244 accessed the Internet through the mobile phones, whereas 98 participants used computers. This indicates that the popularity of using mobile technology has outpaced the usage of computers among the participants. This confirms the findings of Barrenecha and Jenkins (2014) in which the use of mobile applications worldwide has opened the horizon for information exchange between citizens and their government institutions and vice versa. Hence, the mobility has reduced the digital divide among citizens, especially in developing countries (Barrenechea and Jenkins 2014). Therefore, this trend is worthy of focus and could be taken forward by the Libyan government agencies and institutions to work on m-government by increasing the use of mobile applications and networks.

6.13.5 Gender

Males are at greater risk than females. Culturally, in Libya, the male is responsible for the whole family, excluding certain rare cases where women

are unable to find a male member to carry out the job, and therefore the female does that job instead. The model demonstrates that the male participants are more active in using the e-passport system, either collaboratively or alone. Also, the female participants comprised only 20% of the total population sample, which could be the reason why they appear to be less collaborative. On the other hand, females suffered more from the impact of the risk on their safety compared to the males, if considered proportionately. Table 6-15 below gives the detailed figures.

Table 6-15: Citizens' safety comparaison Female Vs Male

Questions	Male		Female	
	5&4	1&2	5&4	1&2
Q15.1	464	69	129	18
Q15.2	281	189	87	41
Q15.3	263	252	63	70
Q15.4	429	104	121	17
Q15.5	110	419	30	100

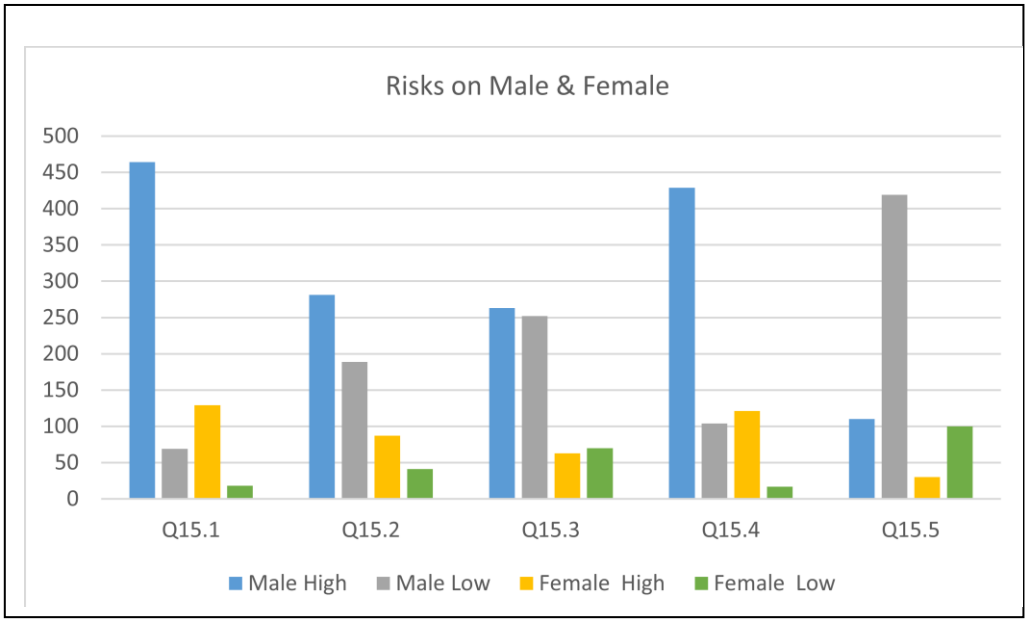

Figure 6-5: Risk on both gender

The chart in Figure 6-5 illustrates that females have considerable fear of the risk of being kidnapped, from being killed, and fear for the safety of their possessions and the risk of them being stolen. If these figures are compared with the male cases, it is clear that the females perceive more risk than males during chaotic environments. Hence, they are in favour of using online rather than face-to-face services.

6.13.6 E-passports issued through collaboration

The cases of corruption have a significant negative impact on trust in government institutions, which reflects that the government have realised the amount of corruption that has spread within the country among the formal

institutions. Also, the time is not appropriate to fight such corruption, but delivering the necessary e-services has opened the door to social collaboration and enabled these services to be offered.

With regard to sharing internet accessibility, the results show that 344 participants have shared their internet access with either their neighbours, friends or relatives. This spirit of sharing and collaborating reflects the impact of conflict in the country and the instability of the situation. This is demonstrated by the attempts to create a complementary environment among the citizens themselves. It appears from e-passport usage that social collaboration has a significant relationship with trust in government institutions as an e-services provider and the lack of citizens' safety, which represents the outcome of chaos and conflict. Nixon and Mallett found that informal bodies, represented by social norms and connections, enjoyed more positive attitudes than the formal government institutions (Nixon and Mallett 2017).

The SPSS cross-tab results, shown in Table 6-16 below, between age groups and e-passport usage, shows that 98 participants who are below 30 years old had used the e-passport system through either their friends or relatives. On the other hand, in the age group of 31–50 years, 212 participants used the e-passport systems through their friends and relatives. While in the age group, who are over 50, 48 participants indicated that they had used the e-passport system through their friends and relatives. In total, 358 participants, which

represents more than 44% of the total population, had used social collaboration to obtain their e-passport.

Table 6-16: Issuing e-passport based on age group

Age Group	E-passport issued through citizens acting alone	E-passports issued through relatives and friends
<30	120	98
31-50	338	212
>50	89	48

6.13.7 E-passports issued through citizens acting alone

It is clear from the output that only during a chaotic environment, where there is poor infrastructure and lack of safety, were the participants able to use the e-passport system while also aiding others. Therefore, social collaboration is the mechanism which helped in the usage process. It is also important to note that a passport is compulsory, and citizens need to be ready to travel for any reason due to the civil war.

The SPSS cross-tab results shown in the table above illustrates that the participants in the age groups below 50 are mostly aware of the use of technology who were able to use the system themselves and help others. If the age group below 30 is added to the 31–50 group, then the result will be over 50% of participants have an awareness of the e-government service and can apply and aid others.

6.13.8 The participants' education level

There is no significant difference between the moderation effects on the e-passport usage among the participants with different education levels. Most education levels had the same effect. Table 6-17 below shows the cases which used the e-passport system either by themselves or through the help of their friends and relatives. It shows that most of the participants were graduates with either a BSc, Masters or PhD. It can be concluded that during a chaotic environment all of the community layers and education levels are involved in aiding and collaborating with each other to receive the services offered.

Table 6-17: E-passport issued based on education level

Education Level	E-passport issued through citizens themselves	E-passports issued through relatives and friends
Secondary level or below	42	36
Bachelor or equivalent	231	160
Post-graduate level	272	162

Participants in the education level below a Bachelor degree are the most collaborative and confident in using the e-passport system compared with the other education groups. Figure 6-7 illustrates the Smart PLSc algorithm output that shows R^2 in the final endogenous latent variable "Social collaboration" as the highest among other education levels.

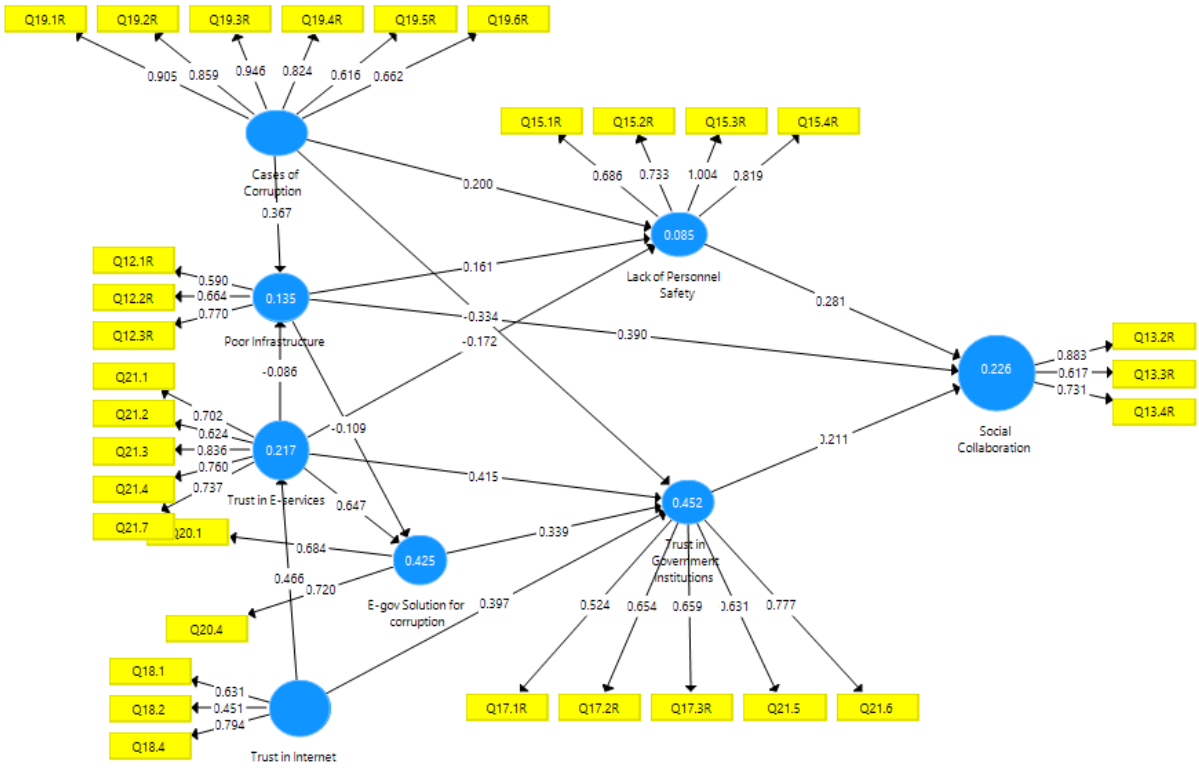

Figure 6-6: PLSc Algorithm for the BSc or equivalent education level

6.13.9 Work experience effect

The more work experience the participants have, the more awareness they build regarding the significant role of e-government towards fighting corruption. Furthermore, they are also aware of the impact of e-services on the lack of citizens' safety and security which is caused by the conflict and chaotic environment. The senior participants are also similar to the previous group, which indicates that the greater seniority the participants have, the more they are aware of the importance of the e-government, and they trust in government and their institutions' commitment. The result highlights the

seniority criteria, where the young citizens are more collaborative and willing to use and help in any ICT-related work (Tapscott 2009; Mearns et al. 2015).

6.13.10 Impact of citizens' safety on age groups

With regard to the age groups, which are related to the questions about citizens' safety and the participants' fear of trauma, Table 6-18 illustrates the data which lies on the extreme right or extreme left and excludes the central responses or the neutral cases.

Table 6-18: Impact of citizens' safety on age group

Questions	Age Group < 30		Age Group 31-50		Age Group Above 50	
	5&4	1&2	5&4	1&2	5&4	1&2
Q15.1	20	146	57	354	10	103
Q15.2	40	107	165	198	25	63
Q15.3	76	81	207	180	39	65
Q15.4	27	135	83	308	14	108
Q15.5	99	40	223	77	87	25

It is noticeable from both the table and the associated graph in Figure 6-7 that the younger the participants, the less they are concerned about the chaotic environment, and the more active they are in collaboration, and more trusting of the government institutions and e-services. On the other hand, participants who are older, they are more affected by the chaotic environment and are less collaborative and less trusting of government institutions and e-services.

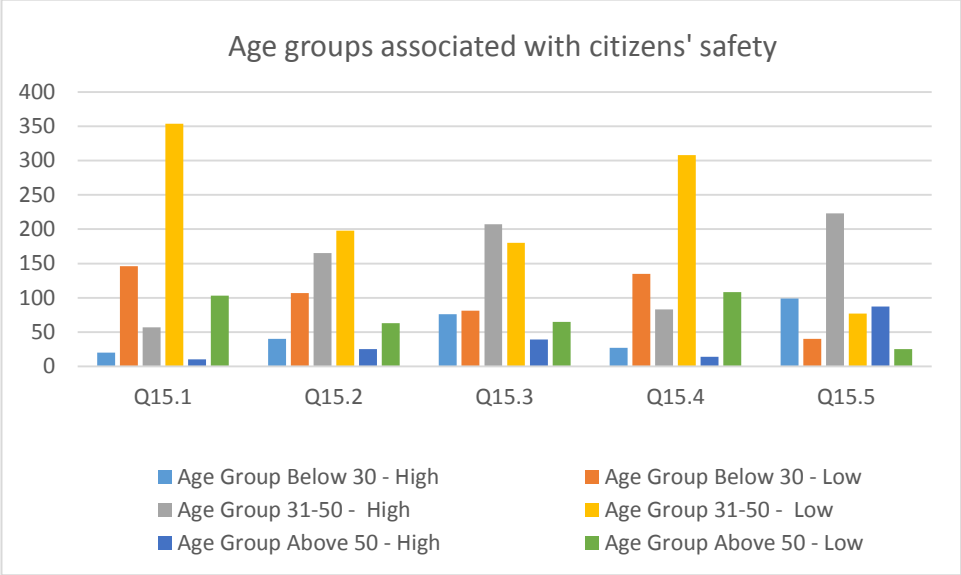

Figure 6-7: Age Group associated with citizens' safety

As the elderly are either parents or responsible for families, therefore the conflict and chaos has a greater impact on them than the younger participants. Young people are fond of new technologies and taking a risk is part of their daily life. This result concurs with Tapscott and Mearns et al.'s findings that young people from ages 11 to 30 are the greatest adopters of new technology and all applications related to it (Tapscott 2009; Mearns et al. 2015).

6.14 ***Findings***

E-government in Libya is oriented towards providing public services to citizens. It is evident that Libya has passed through several radical political changes since 2011. Since then, according to international reports and local eyewitnesses, instability and the chaotic environment has become the

prevailing situation in the country and is worsening day-by-day (Amnesty International Secretariat Office 2015). Hence, the current situation of the state of Libya plays a role in increasing corruption in all of the country's public service sectors, where bribery is widespread and inefficient government bureaucracy hampers business activities (Sehested 2017). In addition, weapons and militia are widespread throughout the country's cities and towns (Amnesty International Secretariat Office 2015), which has an impact on the country's stability.

It has been noticed, even when there was a limited ICT infrastructure, which citizens still managed to utilise the intermittent access to mobile internet communication. About 84% of the participants reported that they were accessing the internet through mobile phones. Hence, it has played a significant role in connecting citizens to the government services when the local government information became accessible. Running local services by utilising the available limited mobile networks was, nevertheless, sufficient to make the e-passport process a success. Also, it is interesting to note that because citizens fear for their safety and there is a lack of infrastructure, they utilised social collaboration with their friends, family members and colleagues to complete their day-to-day work and access the available limited public services like the e-passport.

It is evident that the trustworthiness components had a significant relationship with each other and with the role of e-government in fighting corruption, as the

influential factor resulted from a chaotic environment. It emerged that the trustworthiness factors (trust in internet, e-services, and government institutions and their commitment) through the commitment of the formal institutions and the aid of the spirit of social collaboration made the e-passport process a success during the chaotic situation (Smith 2010). It is clear from the findings, which have been illustrated in the previous figures, the spirit of social collaboration has positively impacted on using e-government services (e-passport). This, in turn, has a positive impact on the factors arising as a result of the state of chaos. Trustworthiness has encouraged the limited formal government institutions to commit to implementing the e-passport despite the limited resources and the chaotic environment. Furthermore, the trustworthiness and commitment of the formal government institutions, that were responsible for e-passports, have also encouraged citizens to use the e-passport online system by all the available resources and means through the collaborative spirit among them. The formal government institutions are obliged to work towards delivering the necessary services in such a situation. Hence, trust is the backbone of offering any e-services project. The higher the trust, which comes from legitimacy, the formal institutions enjoy, hence the less they rely on other means such as informal institutions (Nixon and Mallett 2017). Libyan government institutions have been divided and scattered among two central governments since the second election in 2013, and every party claims legitimacy.

Although government support and commitment, as well as funding, are vital in implementing such large-scale IT projects in stable conditions (Altameem et al. 2006; Irani et al. 2007; Weerakkody et al. 2011), in a chaotic environment this is found to be slightly different because of the circumstances on the ground. The study shows that the formal institutions related to the e-passport were trusted and committed to implementing this project, despite the limitation of infrastructure, the lack of safety, funds and security. The implementation contributed to reducing the corruption which usually accompanied conflict and chaotic situations. There were a significant number of citizens who had applied the e-passport system, accessing all the available means, through informal rules represented in the spirit of social collaboration among them. There are several findings that can be drawn from the discussion of this model.

1. The chaotic environment is driven by three main factors, which are significantly related together. These factors are cases of corruption, poor infrastructure and lack of citizens' safety.

2. Cases of corruption and poor infrastructure are positively related together (Gillanders 2014) and both negatively impact on trustworthiness (World-Economic-Forum 2017).

3. The extensive collaboration and participation opportunities offered by the e-government initiatives (Misuraca et al. 2012), together with the

spirit of social collaboration among citizens, enables them to adopt and use the e-services even in chaotic situations.

4. E-services has the potential to reduce the impact of risks on citizens (Pathak and Kaur 2014).

5. There is a significant role played by the informal bodies, which are represented in kinship, friendship and neighbourhood, on using e-services that are offered by the formal institutions during chaotic environments. This is due to the fact that citizens perceive the value of using the e-passport system and this encourages them to use other e-services whenever they are offered (Estrin and Prevezer 2011; Hanley 2014; Chan et al. 2015).

6. In the absence of the authority of government and government institutions in a chaotic environment, there could be an opportunity to initiate a collaborative environment between formal and informal bodies to work together to support e-government implementation.

7. E-government can still be implemented by offering essential and urgent services and applied even with limited infrastructure and a chaotic environment.

Focusing on human interaction and its importance, especially during chaotic situations, it is apparent that these types of interaction have been repeated

again and again; for example, in Bosnia and Croatia (Pejovich 1999). In Eastern Europe, there is evidence that successful interactions were informally institutionalised into traditions, beliefs, moral values, taboos and so forth (Marosevic and Econ 2013). Shandana Khan Mohmand (2016) found that the inclusion of informal institutions has the potential to strengthen the governance process. Furthermore, this fills the gap which is caused by the absence of formal government institutions, highlighiting the challenges and improving the governance process (Mohmand 2016). Technology, as a backbone of e-government adoption and implementation, in itself is not enough, hence it is contingent upon national, social and institutional factors (Park 2017). Hence, implementation and using e-government services are shaped by social and institutional factors, in addition to others which are related to technical and organisational factors.

On the other hand, it was found that trust in government institutions' commitment achieved the highest value of R^2 which indicates that in a chaotic environment it is important to rely on the middle management within the departments in the institutions to commit to the previously planned projects and implement them. The role of middle management in institutions' commitment appeared to be important during unstable conditions (Wooldridge et al. 1990; Floyd and Wooldridge 2000). Therefore, relying on the commitment of the institutions' lower departments in e-government implementation was found to be effective in this study and concurred with the

claims of Wooldridge and Floyd (Wooldridge et al. 1990; Floyd and Wooldridge 2000). The Figure 6-8 and Figure 6-9 shown below illustrate this in more detail.

These factors are the most important during chaotic environments and need to be the subject of focus during implementation of e-government services. The model in Figure 6-8 shows that all of the factors contribute to the implementation of e-government and citizens' usage processes. Although there was some disparity in the strength of this participation, these factors played a role, either regarding the implementation or the usage processes.

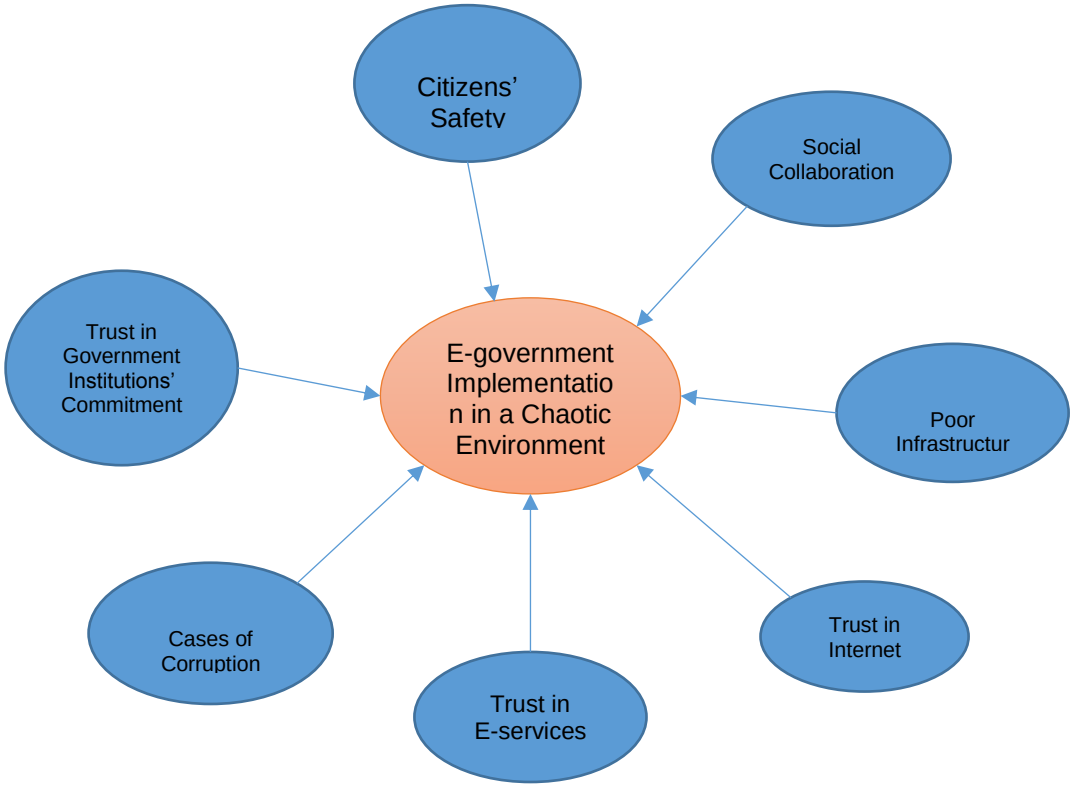

Figure 6-8: Important factors impact on e-government implementation during chaotic environment

Table 6-19 illustrates the average R^2 taken to represent the contribution percentage of the factors involved in the research model (Kock 2011; Boido and Fasano 2015; Abdul 2017). It shows the strengths of the main factors contributing to the model based on the groups' analysis. The percentage excludes the remaining factors which are discussed in chapter five. The factors that formulated this research model were found to be the most important ones during the implementation and usage of the e-passport process during the chaotic environment.

Table 6-19: The Average of Determination Coefficient for specific Data Groups – R^2 Values

		Indigenous Latent Variables Constructs				
Data Groups		Citizens' safety	Social collaboration	Trust in Gov. institutions commitment	E-gov. solution for corruption	Average
Age Groups	Below 30	0.174	0.141	0.312	0.535	
	31-40	0.133	0.078	0.452	0.379	
	41-50	0.263	0.101	0.366	0.471	
	Over 50	0.142	0.077	0.430	0.417	
	Average	*0.178*	*0.099*	*0.390*	*0.451*	*0.279*
Sex	Male	0.141	0.101	0.339	0.416	
	Female	0.192	0.072	0.429	0.437	
	Average	*0.167*	*0.087*	*0.384*	*0.427*	0.266
Education Level	High Diploma or less	.085	0.226	0.452	0.425	
	BSc. or Equiv.	0.269	0.099	0.367	0.557	
	Post-graduate	0.141	0.066	0.310	0.346	
Average		*0.165*	*0.130*	*0.376*	*0.443*	0.279
Internet Access	Mobile	0.133	0.111	0.256	0.353	
	Computer	0.323	0.262	0.390	0.354	
	Mobile & Computers	0.135	0.081	0.404	0.520	

	Ipad, Tablets or others	0.190	0.08	0.453	0.594	
Average		*0.195*	*0.134*	*0.376*	*0.455*	0.290
E-passport Issued by	Alone	0.153	0.108	0.371	0.506	
	Social Collaboration	0.121	0.078	0.302	0.312	
Average		*0.137*	*0.093*	*0.337*	*0.409*	0.244
Average of Averages of R^2		**0.139**		**0.373**		**0.272**

From Table 6-19 and Figure 6-10 it can be concluded that the prospect of e-government implementation in a chaotic environment is open and possible, if the factors mentioned in the above model are taken into consideration. These factors are empirically tested in this research, where the study reveals that the trust in government institutions' commitment and the citizens' social collaboration are crucial factors towards implementing and using e-government services in chaotic and non-normal environments. Social collaboration is caused by the lack of citizens' safety and the poor infrastructure indigenous factors. These two factors encourage citizens to collaborate to receive the services offered by the available and resource-limited government institutions in certain cities.

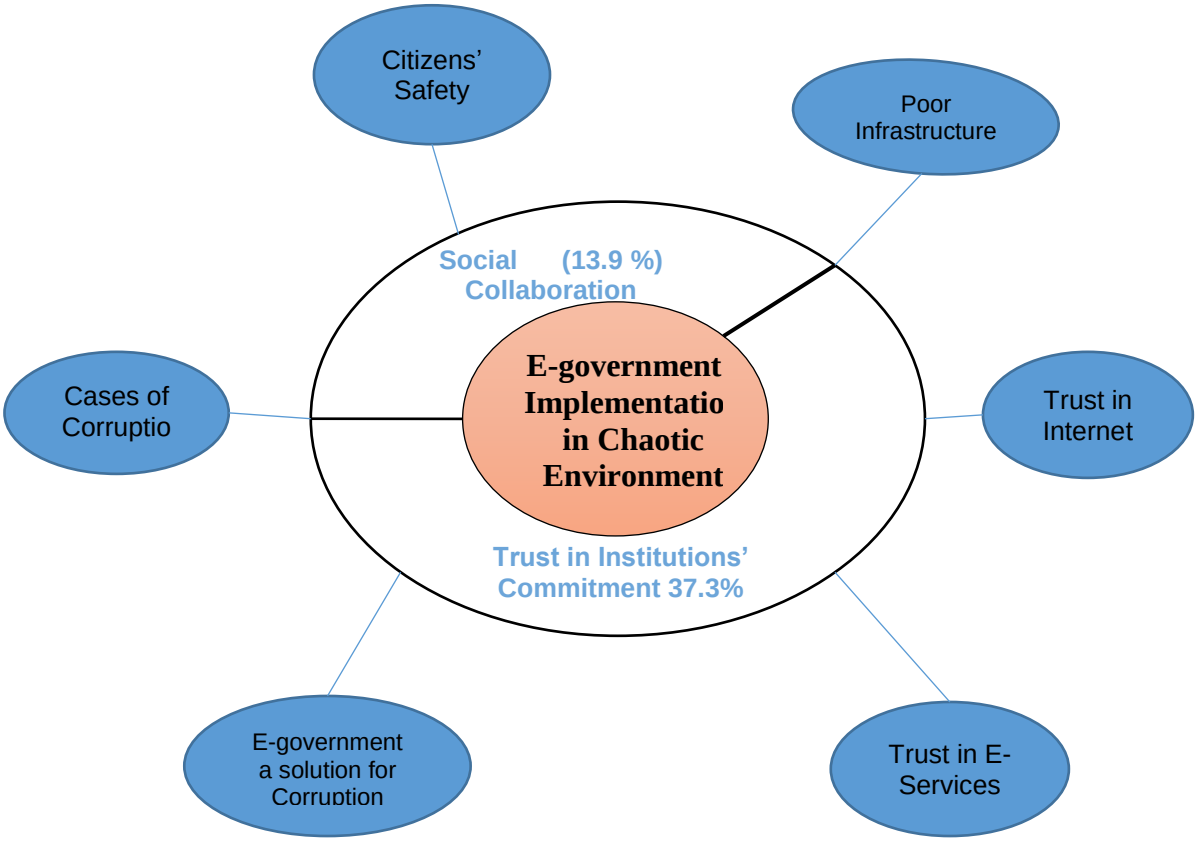

Figure 6-9: Social Collaboration Model

Although these institutions, represented in the e-passport and NID departments, suffer with the limitation of their resources, they are committed to implementing the necessary e-services to curb the cases of corruption that emerged during the chaotic situation. Citizens trust these institutions' departments based on their commitment and try their best to utilise these services by all available means. From the above results it is noticeable that the trust in the internet latent variable and trust in e-services latent variable were recorded as the most significant values in both results. It has been found that in healthy and stable environments trustworthiness is an essential factor

(Smith 2010; Wang and Lo 2013; Aladwani 2013; Porumbescu 2016; Lallmahomed et al. 2017) in adoption and implementation of e-government, which was found to be the same in a chaotic environment. This indicates that trustworthiness plays a vital role in the implementation of e-government services regardless of the environment.

The lack of citizens' safety and the poor infrastructure could overcome by encouraging and establishing social collaboration networks throughout the country's towns and cities. As a result of the lack of strong government institutions, the existing institutional departments could demonstrate commitment by taking the initiative to proceed with the delivery of essential electronic services to traumatised citizens through those social collaboration networks. Hence, the cases of corruption can be tackled and fought through the e-government services like the NID and e-passports systems.

6.15 ***Formal and informal institutions***

The formal and informal institutions are the two main components that play a vital role in the whole process of implementation and use of the e-passport system. In this study, these have emerged in the form of citizens' social collaboration (United Nations 2007; Sultan et al. 2012; Banting 2015).

These facts are also found within countries that have enjoyed stable conditions for decades and underline the need for this type of cooperation between the

formal and informal institutions in chaotic environments. The informal institutions, represented by citizens' social collaboration, showed that the e-passport process has been successfully implemented by the formal institutions (E-passport and NID Department) and was successfully applied through the informal institutions (citizens' social collaboration). This situation lead the researcher to agree with the idea that the existence of interaction or interplay between the two institutions (formal and informal) is essential, especially during a crisis and chaotic environment (Pejovich 1999; Başkan-Canyaş and Canyaş 2016). Where the optimum goal from this cooperation between the two institutions is to formulate one system this lead to the retention of state stability and the reconstruction of government institutions.

In situations where formal government institutions are weak, an essential role can be played by informal institutions, such as the social collaboration represented in friendship, kinship and neighbourhoods (Peng and Heath 1996; Huaili and Wanli 2015). Ties and relations among citizens need to be well regulated to maintain the valid role of formal institutions' governance mechanism (Huaili and Wanli 2015). Therefore, these are expected to be issued by the legitimate legislative bodies if they exist, or from initiatives of each institution's related departments.

6.15.1 Informal institutions

Based on the approach which was introduced in chapter three, social collaboration is considered to be an informal institution. The individuals, who are represented by friends, colleagues, family members and relatives or services offices, should be given the authority to apply for groups and work on their behalf. The aims of this representativeness, which is the essence of social collaboration, is to ease the difficulties faced by citizens during chaotic situations. It has been found that the advantages of social collaboration help citizens to book their appointments online and receive their e-passports with as little effort, as these services may be found in some cities but not in others.

6.15.2 Formal institutions

The commitment that has been shown by the e-passport and NID department during the difficult situation since 2011 has increased the trust among citizens towards those institutions. The trust in the institutions' commitment is registered as the formal part of the institutions that help in the NID and e-passports implementation process. Without this commitment there would be no services and the citizens' suffering could have increased.

Trustworthiness strengthens the relationship between institutions' departments and citizens. Where there is a chaotic environment, represented by the lack of safety, poor infrastructure and cases of corruption that has impacted equally on the implementation and the usage of e-passports. Each

factor has contributed to the e-government implementation, either by facilitating the implementation process or by encouraging its usage by the citizens.

Social media and information technology, generally, enabled individuals to interact and collaborate with each other worldwide as if they are in the same place. This refers to real-time interaction, which is of great importance during crisis and conflict situations to enable citizens to help each other. This type of engagement is naturally accepted worldwide as a cultural phenomenon observable in active human groups (Kock 2008). Citizens' engagement and social collaboration have the potential to initiate the C2C type of e-government services which enable those active citizens' groups to provide the e-services offered during conflict and chaotic environments. Enabling these groups to use the e-government services and help others to receive these services, will also benefit the services provider to guidance and improve this service (Kock 2008).

Libya is suffering from both a chaotic environment and geographical dispersion. These situations have impacted on the day-to-day life of its citizens. Also, the existing governments have failed to maintain stability and deal with the lack of citizens' safety, security and the spread of corruption. Hence, this research study found that the citizens' social collaboration could have the potential to promote formal governmental institutions to maintain stability and cope with the spread of corruption. These groups can be

represented by the heads of local municipalities, influential tribal personnel, or heads of tribal groups, through introducing government policies and regulations to organise the e-services provision to the citizens over the entire country.

6.16 ***The e-government implementation framework***

The formal institutions represented by the existing departments, agencies and organisations have responsibilities towards their citizens to provide them with daily public services. During instability and conflict, these institutions are required to prioritise these services. The institutional theory perspectives call these responsibilities a coercive pressure which drives those governmental bodies to prioritise the services needed and focus on the most important ones. Those institutional departments are required to follow the design and implementation of processes, initiating from the quality, security and staffing success factors, which were discussed in detail in chapters three and five. These CSFs are essential and must be taken into consideration in any environment, as they are related to the deliverables and their qualities. In addition to those CSFs, the new factors were driving and forcing the existing governmental institutions' departments to implement the e-passport and NID during the conflict and chaotic environment. This gives the answer for the RQ4 and 5.

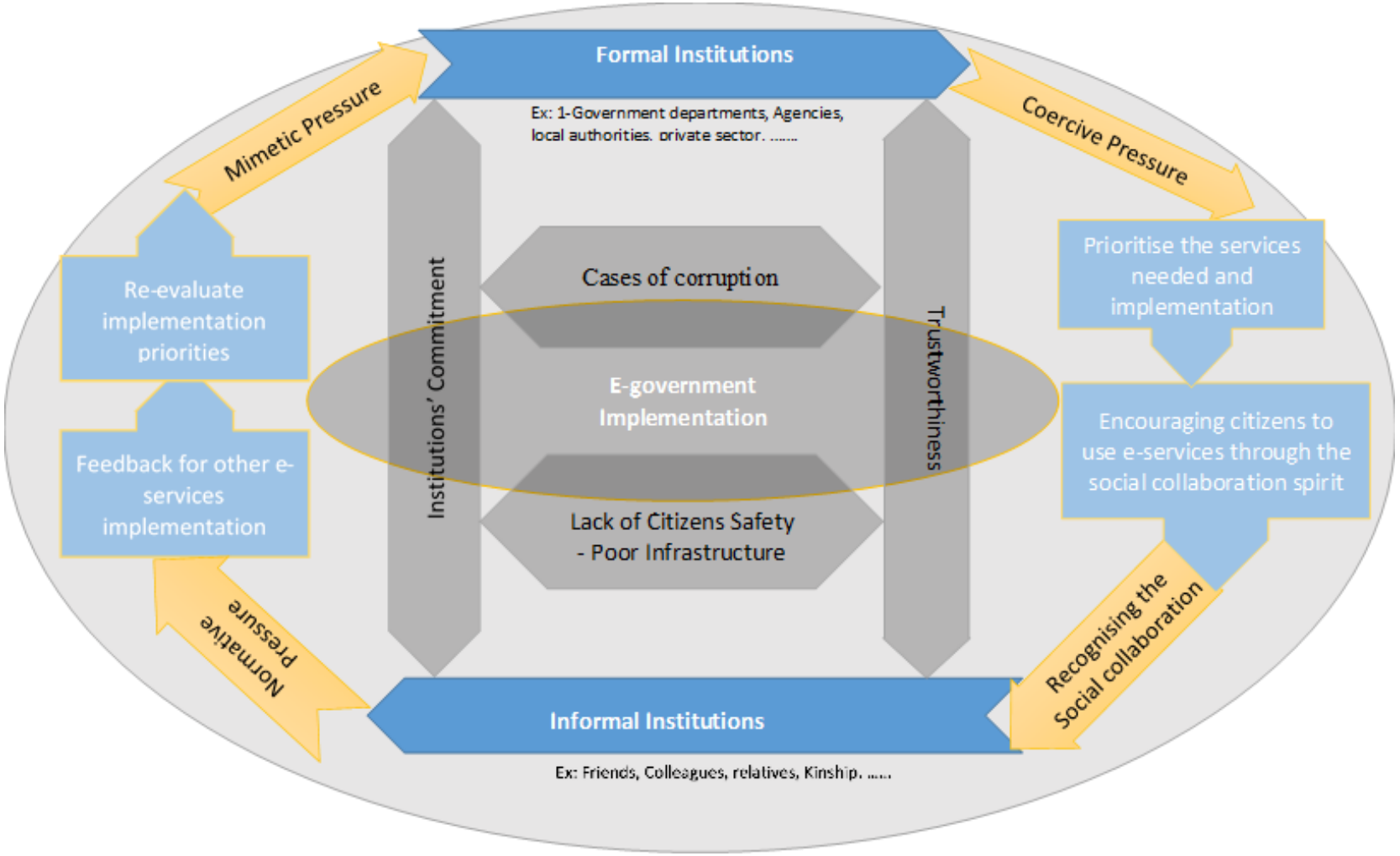

Figure 6-10: Framework of E-Government Implementation in chaotic environment

Social collaboration, in general, has the potential to enhance public services delivery by improving the quality of provision, efficiency of the services and the flexibility of fostering of the innovation (Pitcher 2014). Hence, during the crisis and chaotic environment, recognising social collaboration is an essential factor to be taken into account by the existing governmental agencies which are responsible for delivering services. This recognition provides legitimacy to the collaboration process among citizens to help each other, especially when receiving the public e-services offered by governmental institutions. Those citizens who are suffering from lack of safety or lack of infrastructure in the cities where they live can assign someone who is a relative, friend, or colleague in another city to act on their behalf.

The lack of trust, which was produced by the conflict on the ground and the chaotic situation that emerged subsequently, is one of the barriers to managing conflict and to building viable institutions based on the principles of democracy (Kulkarni 1999). Although it has been argued by Kulkarni (1999) that profound lack of trust creates a barrier for social collaboration, the current research study found that trust and social collaboration created a substantial ground for the e-passport and NID to be successfully implemented and used by the traumatised citizens. Hence, the ground is ready for managing conflict, reconciliation and building the state framework based on the collaborative behaviour. Therefore, it can be claimed that the public services which were delivered online during the chaotic environment are evidence that indicates

the commitment of the government departments, which in turn reflects the solidarity that citizens have given to these institutions in such circumstances, through the usage of these e-services despite the difficulties on the ground.

Given the factors of trustworthiness, citizens' social collaboration, lack of safety and the poor infrastructure, it is imperative for the responsible authorities to recognise and provide assistance to the volunteers to support and serve citizens from all cities, especially in respect of e-services and other necessary daily services. This recognition can be achieved through the legitimisation of this type of service, which is carried out by individuals among themselves, which is predominantly voluntary.

Coercive pressure forces the existing government institutions to prioritise the e-services delivered to citizens. These e-services are found to be used by citizens despite the situation on the ground through their social collaboration. This needs to be recognised and legitimised to widen its scope throughout the country to ease the e-services usage among citizens. This usage opens the horizon for informal institutions to provide feedback and suggest other e-services that might be urgently needed during conflict situations. In line with Hoque (2008), who claimed that coercive pressure does not work alone, it is evident in this research that coercive pressure in tandem with normative pressure that can be utilised as a catalyst for implementing other e-services in a chaotic environment (Hoque 2008; Keerasuntonpong and Cordery 2016). It can be claimed here that normative pressure works to push the existing formal

institutions, with their limited resources, to mimic the e-services suggested or found to be essential to be implemented.

6.17 ***How to implement this framework***

To implement this Framework actions need to be undertaken at number of levels and by all the relevant sectors. From the framework shown in figure 6-10 the Implementation is based on the following basic steps:

1- Formal institutions represented by the existing government departments, bodies should conduct planning and prioritise the services which are urgently needed to be implemented in such environment.

2- Planning how the services are going to be used by citizens by finding the safest possible areas and guarantee the Internet connections and resourcing.

3- Allocating responsibility among the local authorities to allow using all the possible means by regulating and issuing the corresponding policies to allow citizens to be socially collaborated and encourage this essence among the citizens.

4- Evaluating and monitoring the implementation process by checking the feedback from all parties, which might differ from city to another.

5- Informing the formal institutions by the success of the current implementation to mimic it for implementing other e-services.

6.18 ***The framework in summary***

Based on the above facts, there is an opportunity to integrate the informal and formal institutions by using the e-government initiatives. In the previous Figure 6-10 the relationship between the informal and formal institutions could be increased by the implementation of e-government services and spread of the awareness of its importance among citizens to encourage use. The opportunity is created for citizens' social collaboration to be taken forward by the government-related institutions by legitimising such collaboration, to avoid bribery and other illegal acts which may be utilised. Community leaders, associations and heads of civil society organisations can be given the opportunities to act as a meeting point between the services providers and the beneficiaries to legitimise the spirit of social collaboration.

The role of formal institutions or government is to take control and to merge the informal and formal institutions and work at maintaining stability in the country. E-government services could be applied as a tool to encourage both formal and informal institutions to work together to deliver services to traumatised citizens during chaotic situations. The framework can be formulated based on the following points, noting that the starting point is

always from the existing formal institutions represented by the departments and organisations within the government bodies.

1. Formal institutions are those related departments which take the e-government implementation initiatives. The informal and formal institutions are the boundaries for any e-government implementation initiatives during a chaotic environment (Alonso 2009; Estrin and Prevezer 2011; Marosevic and Econ 2013; Chan et al. 2015).

2. In a chaotic environment, as long as the formal government institutions deliver the public services in different places in the country, these can be used by citizens through social collaboration.

3. Social collaboration can help during chaotic situations where the lack of safety and poor infrastructure may prevent people from receiving their public services (Linders 2012; Guzmán and Sierra 2012; Bertot et al. 2012; Panagiotopoulos et al. 2014; United Nations 2014).

4. There is a chance of increasing the trustworthiness among citizens in e-services during chaotic environments, as it is safer if compared with face-to-face services (Smith 2010; Wang and Lo 2013; Anthopoulos and Sirakoulis 2015; Lallmahomed et al. 2017).

5. There are internal institutional pressures which guide the process of implementation and the usage of e-government services throughout the

life cycle of the e-services (Scott 2014). These pressures must be taken into consideration and used as a framework within which to work. The social norms, which appear as feedback from traumatised citizens, could be utilised as a base for implementing other services (Bardach 1998). The coercive pressure can be utilised to facilitate the legalisation process to reshape and introduce social collaboration as part of the entire implementation process during chaotic environments (Scott 1987; Scott 2014).

6.19 ***Conclusion***

This chapter has thoroughly discussed the analysis of the research model and outlined the findings in the form of a framework. The findings which emerged from the analysis phase helped to understand the reason behind the success of the e-passport process in the state of Libya. The suggested framework may help the existing institutions to take forward the experiences gained from the e-passport implementation process and mimic it, in order to implement other e-services. The social norms, which were represented here by the spirit of social collaboration, facilitated the use of the e-passport process, which was found to be effective during the instability and conflict situations.

Chapter 7: **Conclusion and Future Work**

7.1 ***Conclusion***

Studying a well-known phenomenon in a different environment is one of the most significant challenges, especially during conflict and the accompanying chaotic environment. This research in the domain of ICT and e-government implementation has become an area where it is crucial to study the environment in which the implementation process has been conducted. Previous studies of e-government implementation and adoption have created a tremendous amount of background information for researchers to establish further research studies on different areas. The exceptionality of this research study is represented in the environment of the study. All of the previous research studies which are related to e-government adoption and implementation were conducted within a stable environment. There is a lack of studies related to the implementation of e-government in unstable and chaotic environments. Hence, this study is considered to bring added value to the body of knowledge and the e-government implementation literature in this context.

The case study participants in this research were suffering from the conflict and chaos in Libya even before the study was conducted and, sadly, the situation has remained after accomplishing it. The three stages of this research

study were conducted while the state was suffering from a situation of conflict and the citizens were traumatised by the conflict on the ground, which increased the need for this study and the importance of its results.

On the other hand, the diversity in the methods of data collection applied and the quality of the participants in the study added credibility to the findings and opened the horizon towards further research, as a real national contribution in the most difficult and critical times.

7.2 ***Research Impact***

The impact of this research can be put into the following points:

- The UN can utilise this framework which can be applied to aid governments during conflict to offer services to traumatised citizens to utilise the spirit of social collaboration. Where the social norms and human factors are as important as the technical, political, and environmental factors are.

- The study opens the door for other studies to be conducted in different areas, which could lead to implementing or enhancing services delivery to citizens during conflict and unstable conditions.

7.3 ***Research contributions***

This research study raised several research points, contributions and limitations. With respect to the contributions to the body of knowledge the following are the main contributions:

1. The framework formulated from this study could be adopted to be used for any other areas to follow the success story of e-passport implementation.

2. The comprehensive study of the e-government implementation, CSFs, provides considerable information to help researchers conduct further studies.

3. The new CSFs emerging from this study have added value to the body of knowledge concerning e-government implementation in a chaotic environment and are a point of focus.

4. Despite the circumstances on the ground and unexpected situations which can arise at any time, the citizens have still applied for their e-passports utilising the spirit of collaboration among themselves. Hence, the social collaboration model formulated from this study can encourage formal institutions to depend on informal institutions to spread the culture of reliance on the use of electronic services among citizens.

5. The commitment of the formal institutions' departments in their daily work can achieve a great deal when governments are fragile and dismantled. This commitment needs support and encouragement from all parties including international players, through the UN agencies.

From the above-mentioned contributions, it can be concluded that this study has opened the possibility to conduct several other studies in different areas to help traumatised citizens to survive. Furthermore, it may help the existing government institutions to survive in such situations and innovate ideas to work in emergencies to help citizens. There is an opportunity to utilise the role of informal institutions represented in social collaboration during crisis and conflict, to use the e-services if offered by formal institutions. It is possible to take certain case studies and explore them to reveal the barriers and try to overcome them, or identify success stories which can be adopted and followed for future works.

7.4 ***Limitations***

Any type of research study faces several barriers and difficulties throughout the different stages. Although the study applied several techniques in data collection, the researcher was not able to perform in-depth face-to-face interviews and observations of the cases onsite. This was due to the conflict on the ground, which accompanied this research study from the beginning. In addition, the researcher's location in the UK meant that it was difficult to travel

to the subject country. The circumstances on the ground within Libya prevented the researcher from communicating with a good sample from senior management staff or government officials for several reasons. The most significant reason was the lack of communications, due to power cuts and poor signals. In addition, it was difficult to establish communications with government officials, as would have been possible during a normal situation. A better study may have been achieved if there had been a chance to travel and visit the responsible departments and conduct face-to-face interviews with a large number of government officials.

The sample for the qualitative study was limited to a certain number of participants. This could have been improved and widened to include several senior management personnel from various levels and different cities with better access, however this was difficult during the data collection stage.

7.5 ***Future work***

This research study has opened the door for future research and sheds light on the conduct of further studies in the context of e-government implementation in unstable or chaotic environments and has formulated a base of corruption at all levels. In this section, suggestions for possible continuation of the work presented in this thesis are presented. Each of the following points can be applied as a topic for further research in itself.

- In this thesis, the e-passport service has been taken as an example of implementation and usage of a successful e-government service. It is a compulsory service. Therefore, for further work the following question can be raised: can this success also be found in voluntary services? This can be taken forward and the perceptions of implementing other e-services in such contexts be discovered.

- The spirit of social collaboration which emerged from this study can be taken forward with further studies to undertake the role of e-government in unifying the formal and informal institutions.

- The role of e-government in maintaining stability during an uprising and revolts.

- E-government's role for maintaining citizens' safety during conflict and war.

- E-government's role in attracting investments to remote areas and maintaining the economic and demographic stability of countries with geographically distant areas.

- The role of informal institutions could be widened to become a part of the governmental vision, and objectives in spreading the

e-services culture among citizens during stable or unstable conditions can be investigated.

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Appendix A: Government officials' interview questions and Consent Form

Q1. What digital technologies do you currently use?

Q2. How frequently do you use these?

Q3. Do you use online banking, e-commerce or any other online services e.g. social media?

Q4. How were you introduced to these? How frequently do you use them? Why do you use them?

Q5. What services do you currently receive from the Libyan government?

Q6. How do you receive these services?

Q7. Can you access these services online?

Q8. Q8. Do you think it would be a good idea to access these services online? Why do you say that? Explain in detail?

Q9. Of the services you mentioned which would be most appropriate to access online are there any services you currently don't have that you would like to be able to have access to?

Q10. How do you think online services would be received in Libya?

Q11. Would an investment by government in online services make a difference in your life? If so how?

Q12. Do you think e-government is feasible in Libya? Please explain your answer?

Q13. What in your opinion would e-government look like in Libya?

Q14. Have you experience any e-government outside Libya?

Q15. Can you please tell me about your experience?

Q16. Do you think having e-government in Libya will improve public service provision?

Q17. Do you think if e-government is implemented would Impact on civil-conflict in Libya? If so how?

Consent form for both participants groups

I am currently conducting research into e-government services required by citizens in Libya. I am inviting you to take part in this study by telephone/Skype. The interview will be no more than 40 minutes. I will be taking notes during the telephone conversation and if you agree I will be recording it. Please tick the box below whether you agree or not for me to tape the telephone call. All recordings will be kept in my home in the UK in a locked draw and will be deleted immediately the tapes are transcribed and analysed on completion of my PhD studies. Your name and details will remain confidential and anonymous and your names or any identifying information will not be stored or appear anywhere on any transcripts or publications.

If you agree to take part in the interview, can you please provide me with details of when you think it will be convenient for me to contact you (**best time and date and contact details**?)

انا طالب دكتوراة في جامعة برادفورد – بريطانيا، اقوم حاليا بإجراء بحث في خدمات الحكومة الإلكترونية المطلوبة من قبل المواطنين في ليبيا .عليه، أدعوكم للمشاركة في هذه الدراسة عن طريق اجراء مقابلة باستخدام الهاتف / سكايب .لن تستغرق المقابلة أكثر من 40 دقيقة .يتم خلالها تدوين الملاحظات خلال المحادثة الهاتفية .ان لم يكن لديكم المانع فسأقوم بتسجيل المقابلة بعد موافقتكم طبعا .يرجى وضع علامة في المربع أدناه ما إذا كنت توافق أو لا لاقوم بتسجيل المكالمة الهاتفية .يرجى الانتباه الى ان جميع التسجيلات ستبقى محفوظة في بيتي في المملكة المتحدة في مكان مقفل وسيتم حذفها بعد تفريغها وتحليلها فور الانتهاء من دراستي للدكتوراة .وستكون الاسماء وباقي التفاصيل الشخصية مبهمة تماما ومجهولة المصدر، ولن يتم تخزين أسماء أو أية معلومات شخصية أو اظهارها في أي مكان على أي نوع من النصوص أو المنشورات العلمية.

إذا وافقت على المشاركة في المقابلة مشكورا، نأمل من حضرتكم تزويدي **بالوقت والتاريخ الذي يناسبكم لاقوم بالاتصال بكم(يرجى تزويدنا بالوقت والتاريخ المفضلين لديكم بالإضافة الى تفاصيل طريقة الإتصال.)**

اوافق على المشاركة في المقابلة، نعم/لا I agree to take part in the interview yes/no

أوافق على تسجيل المقابلة، نعم /لا( ) I agree to be recorded yes/no

سأكون موجود على: I am available on :

رقم الهاتف..... Phone Number:

سكايب..... Skype:

البريد الأكتروني..... Email:

وسائل أخرى..... Others:

Appendix B: Citizens' perspectives interview Questions

Gender: …….

Age: ……

Education Level: ……

Position: ……..

Please answer the following questions in detail (use either Arabic or English Languages)

Q1- What motivates you to get an e-passport? (Why you apply for e-passport)
ما هي الدوافع التي جعلتك تسعى او سعيت للحصول على جواز الكتروني ؟ (لماذا تقدمت للحصول عليه)

Q2- What the process you have to go through to get the e-passport

ما هي الإجراءات التي يجب إتباعها للحصول على الجواز الألكتروني

- Formal Process (institutions……) يعني الإجراءات الرسمية (عن طريق مؤسسات...)
- Informal Networks (Family, Friends, Neighbours) و غير رسمية (مثلا العائلة والأصدقاء والجيران .....)
- Infrastructure (Computers/ Connections) و البنية التحتية عن طريق (الحاسب ، الاتصالات)

Q3- How do you pay for the passport? (Cash, Dept. Card, Check ……) كيف تم الدفع للحصول على الجواز الألكتروني

Q4- What are the risks or dangers involved? Example of: ماهي المخاطر الموجودة في هذه العملية بالكامل؟ مثلا:.....

- Personnel risks تكلم عن المخاطر التي يمكن ان يتعرض لها الشخص نفسه
- Financial risksالمخاطر المالية المحتملة
- Other risksاي مخاطر اخرى تواجه المواطن للحصول على جواز سفر

Q5- Do you see any other government services that could or should be provided online? هل ترى ان هناك خدمات حكومية اخرى من المفترض ان تكون موجودة او يجب ان تكون موجودة على الإنترنت؟ -and Why? ولماذا

Q6- What infrastructure do you have access to? ما هي البنا التحتية المتوفرة امامك كمواطن والتي يمكنك استعمالها - مثلا

- Electricity الكهرباء
- Broadband الإنترنت بأنواعها
- Mobile Networks شبكات الهاتف المحمول
- Others أخرى

a- How do you access these infrastructure? كيف تقوم بإستعمالها

b- What is their availability? هل هي متوفرة للجميع

Q7- How do use the current infrastructures? - And for what purpose؟

كيف تقوم بإستعمال هذه البنا التحتية التي ذكرت ؟ ولأي غرض؟

Appendix C: Questionnaire

Citizens Survey

1. عزيزي المشارك أشكركم على المشاركة في هذا المسح المهم حول آفاق تنفيذ الحكومة الرقمية في حالة الفوضى وعدم الاستقرار، دراسة حالة ليبيا. مشاركتكم قيمة لجميع المؤسسات الحكومية التي ترغب في تنفيذ الحكومة الرقمية من خلال الخدمات عبر الإنترنت. هذا الاستبيان هو جزء من الوفاء لدرجة الدكتوراه في علوم الحاسب الآلي سيستغرق الاستبيان التالي حوالي 10 دقائق لإكماله. المشاركة في هذا البحث هو حسب رغبة كل فرد. ستبقى جميع إجاباتك سرية وستتم إزالة أي مواد تعريفية لضمان عدم الكشف عن هويتك. لن يتم توثيق أي إجابات شخصية ، إلا أن نتائج المجموعة بالكامل سيتم توثيقها أو عرضها. إذا كنت تشعر أنك لا ترغب في المشاركة ، فيمكنك التوقف متى شئت او الضغط على كلمة (لا). إذا ضغطت على (نعم) وعاد الاستبيان بإجابات مكتملة ، فسيتم اعتبار ذلك بمثابة موافقتك على المشاركة في هذا البحث. ومع ذلك، فإنك لا تزال حر في الانسحاب في أي وقت دون إعطاء سبب يرجى إعطاء رأيك بصراحة لأنها ستكون ذات قيمة عالية لكل من الباحث وجميع المؤسسات الحكومية التي ترغب في تحسين الخدمات الرقمية للمواطنين. في النهاية أشكركم على أخذ الوقت لقراءة هذه المعلومات والمشاركة في البحث.

Dear Participant Thank you for agreeing to take part in this important survey about the prospectus of the implementation of digital government in chaotic environment and instability, a case study of Libya Your participation is valuable to all government institutions who want to implement or to develop the implementation of digital government This questionnaire is part of the fulfilment for my PhD degree in Computer Science The following questionnaire will take approximately 10 minutes to complete Taking part in this research is up to each individual. All your answers will remain confidential and any identifying material will be removed in order to ensure your anonymity Any individual answers will not be documented, only the group results will be documented or presented If you feel you do not want to participate just choose (No). If you choose (YES) and the questionnaire returns with answers completed, this will be taken as your agreement to participate in this research However, you are still free to withdraw at any time without giving a reason before the final submission Please give your opinion frankly as it will be of a high value for both the researcher and all government institutions as they want to improve their digital government for citizens Thank you for taking the time to read this information sheet and taking part in the research

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Are you happy to proceed? هل أنت موافق بالاستمرار بالمشاركة *

☐ Yes نعم

☐ No لا

2. العمر Age *

 أقل من20 Less than

 20-30

 31-40

 41-50

 51-60

 فوق Over60

3. الجنس - Gender *

 ذكر Male -

 أنثى Female -

4. مكان إقامتي في ليبيا : مثلا (بنغازي) - Hometown : Example - Benghazi *

5. المؤهل العلمي - Education Level *

 دبلوم عالي High Diploma

 الثانوية العامة او ما يعادلها Secondary or equivalent

 أقل من الثانوية العامة Below Secondary School

 ماجستير Master

 دكتوراة PhD

 بكالوريوس او ما يعادلها Bachelor or equivalent

6. وظيفتي الحالية - My current position *

7. سنوات الخبرة Experience years *

 أقل من5 Less than

 10-5

15-11

20-16

25-21

30-26

أكثر من Over30

8. عدد المرات التي تستخدم فيها شبكة المعلومات الدولية How often do you use the internet *

مرة واحدة في الشهر أو أقلOnce a month or less

مرة في الإسبوعOnce a week

عدة مرات في الإسبوعSeveral times a week

يومياDaily

عدة مرات في اليومSeveral times a day

9. استخدم شبكة المعلومات الدولية لغرض - اختار كل ما يلايمك Choose all relevant - I use the Internet for *

لغرض تصفح الأخبارFor watching news

للتواصل بالأهل والأصدقاءKeep in contact with family friends

لدفع الفواتيرTo pay bills

للصيرفة الآليةOnline Banking

للحصول على الخدمات الحكوميةTo access government services

للتمتعFor entertainment

أخرى (يرجى التحديدOthers(please specify

10. لتصفح الإنترنت في الغالب أستخدم الآتي - اختار كل ما يلايمك To access the Internet, I mostly use the following - Choose all relevant *

الهاتف المحمولMobile phone

حاسب آليComputer

اجهزة لوحيةTablet

آي بادIpad

أخرى (يرجى التحديد:Others(please specify

11. كيف يتم حصولك على الإنترنت (اختار كل ما يناسبك How do you access the Internet (choose all relevant *

من مزود خدمات الإنترنت على الهاتف المحمول مثل ليبيانا والمدار By Internet provider Via my mobile phone

من مزود خدمات الإنترنت بالبيت مثل الخط الأرضي By Internet provider using my computer at home - ADSL

من مقاهي الإنترنت مثل الأكشاكBy Internet provider using Internet Café

من خلال مكان عملي By internet service provider at work

من خلال جيراني Via my next door neighbours

من خلال اصدقائي Via my friends

لا استطيع ان اتحصل على الإنترنت مطلقا I cannot access the internet at all

أخرى (يرجى التحديد:Others(please specify

12. كم مرة حدث لك ما يلي How often the following happened to you *

	Always دائما	Very Often غالبا	Sometimes بعض الأحيان	Rarely نادرا	Neverأبدا
إنقطاع الكهرباءElectrical Cut-off					
فقدان تغطية الهاتف المحمول Loss of Mobile signal					

	Always دائما	Very Often غالبا	Sometimes بعض الأحيان	Rarely نادرا	Neverأبدا
Loss of access to فقدان إشارة الدخول للإنترنت the Internet					

13. كم مرة قمت بما يلي * How often do you do the following

	Always دائما	Very Often غالبا	Sometimes بعض الأحيان	Rarely نادرا	Never أبدا
شاركت جيراني للحصول على الكهرباء Share electricity with neighbours					
شاركت اصدقائي للحصول على الإنترنت Share Internet with friends					
شاركت اقاربي للحصول على الإنترنت Share Internet with relatives					
شاركت جيراني للحصول على الإنترنت Share Internet with neighbours					
استعمل مولد خاص للكهرباء Using private power supply					

14. الطرق المتبعة للتقدم على جواز سفر - اختار كل ما له علاقة choose all - How do you apply for E-passport relevant *

 بإستخدام منظومة الحجز بنفسي Using e-passport reservation system by my self

 من خلال اصدقائي Through friends

 من خلال اقاربي في مدينة اخرى Through relatives in another city

 من خلال احد افراد اسرتي Through one of my family members

 لم اتقدم لإستخراج جواز سفر بعد I did not apply for e-passport yet

 أخرى (يرجى التحديد) Others(please specify

15. المخاوف التي قد تواجهك عند التقدم للحصول على خدمات حكومية - مثل جواز سفر Which trauma you could experience when applying for government services - E-passport for example *

	Always دائما	Very Often غالبا	Sometimes بعض الأحيان	Rarely نادرا	Never أبدا
أخاف أن يتم اختطافي I am fearful of getting kidnapped					

	Always دائما	Very Often غالبا	Sometimes بعض الأحيان	Rarely نادرا	Never أبدا
I fear for the safety of my possessions from being theft (my car for example) أخاف على ممتلكاتي من السرقة - كسيارتي مثلا					
I fear for the physical safety of my family أخاف على سلامة افراد أسرتي					
I fear of getting shot أخاف ان يتم قتلي					
I have to make careful travel plans in advance اخطط بعناية مسبقا عند السفر					
I have no fear for my physical safety لا يوجد خوف على سلامتي الشخصية					

16. إلى أي مدى عززت خدمات الرقم الوطني والجواز الإليكتروني مزاجك ورفاهك ومشاعرك الوطنية. To what extent the National ID and E-passport online services enhanced your mood, well-being and nationalism feelings. *

	لا أوافق بشدة Strongly Disagree	لا اوافق Disagree	محايد Neutral	أوافق Agree	أوافق بشدة Strongly Agree
الحكومة الأليكترونية بإمكانها تحسين مستوى الشعور بالإنتماء والوطنية لدى المواطنين E-government enhances the nationalism feelings among citizens					
لا أخشى على سلامتي الشخصية عندما أتقدم بطلب عن طريق الإنترنت للحصول على جواز السفر I don't fear for my personal safety when I apply online for the e-passport					
أشعر بالفخر عندما أستخدم الخدمات الحكومية عبر الإنترنت I feel proud when I use the government services online					
الخدمات اللأليكترونية وفرت وقتي Online services saved my time					

17. الثقة في الحكومة Trust in Government *

	Always دائما	Very Often غالبا	Sometimes بعض الأحيان	Rarely نادرا	Never أبدا
كم مقدار الثقة في الحكومة لديك؟ How much confidence do you have in government					
كم مرة تعتقد أنه بإمكانك أن تثق في الحكومة How much of the time do you think you can trust the government					
أعتقد أن المؤسسات الحكومية جديرة بالثقة I think Government institutions are trustworthy					
يمكن الوثوق بالوكالات الحكومية لتنفيذ المعاملات عبر الإنترنت بأمانة Government agencies can be trusted to carry out online transactions faithfully					

	Always دائما	Very Often غالبا	Sometimes بعض الأحيان	Rarely نادرا	Never أبدا
إدارة الرقم الوطني والجوازات جديرة بالثقة لعملها في الوقت الراهن The National ID and E-passports Departments are trustworthy for their work right now					

18. الثقة في الإنترنت Trust in Internet *

	لا أوافق بشدة Strongly Disagree	لا أوافق Disagree	اوافق Neutral	محايد Agree	أوافق Strongly Agree	أوافق بشدة
أنا اثق في التطبيقات الأليكترونية اكثر من ثقتي في تطبيقات الوجه لوجه-I trust online application more than face-to-face application						
الإنترنت لديها ضمانات كافية لجعلي أشعر بالراحة في استخدامه The Internet has enough safeguards to make me feel comfortable using it						
أخشى أن تطبيق الانترنت قد يسيء استخدام معلوماتي الشخصية I am afraid that applying online might misuse my personal information						
مخرجات الخدمات الأليكترونية دقيقة The outputs of online services are accurate						

19. في رأيك، إلى أي مدى واجهت حالات الفساد التالية In your opinion, to what extent have you known the following cases of corruption

	Always دائما	Very Often غالبا	Sometimes بعض الأحيان	Rarely نادرا	Neverأبدا
Briberyالرشوة					
Exploitation of Powerإستغلال السلطة					
Fraudالتزوير					
Wasta (Favouritism) and nepotismالواسطة					
Seizure of public propertiesالإستيلاء على الممتلكات العامة					
Multiple Employmentإزدواجية الوظيفة					

20. هل تعتقد تطبيقات الحكومة الأليكترونية تساعد في محاربة الفساد Do you think e-government helps in reducing corruption *

	لا أوافق بشدة Strongly Disagree	لا اوافق Disagree	محايد Neutral	أوافق Agree	أوافق بشدة Strongly Agree
أعتقد أن منظومة الرقم الوطني والجواز الأليكتروني ساعدت في محاربة الفساد I believe National ID and E-passport online services helped in fighting corruption					
الحكومة الإلكترونية بشكل عام لا يمكن أن تسهم في مكافحة الفساد E-government in general cannot contribute in fighting corruption					
إن الافتقار إلى المؤسسات الحكومية هو السبب الرئيسي لهذه الأنواع من الفساد Lack of government institutions is the main reason behind corruption					
تنفيذ الرقم الوطني والجواز الأليكتروني ساهم في الحد من تلك الظواهر The implementation of the National ID and the E-passport contributed to the reduction of corruption					

21. من خلال خبرتك في الرقم الوطني والجواز الإليكتروني ، إلى أي مد توافق او لا توافق على الآتي : Based on your experience of National ID and E-passport, to what extent you agree or disagree with the following *

	لا أوافق بشدة Strongly Disagree	لا اوافق Disagree	محايد Neutral	أوافق Agree	أوافق بشدة Strongly Agree
استخدام الخدمات الأليكترونية فكرة جيدة Using e-government services is a wise idea					
استخدام خدمات الحكومة الأليكترونية شيئا مرغوب It would be desirable to use e-government services					
استمتعت بطلب الحصول على الرقم الوطني وجواز السفر الإلكتروني Enjoyed the application for National ID and E-passport					
أشجع المؤسسات الحكومية الرسمية على توسيع خدمات الحكومة الإلكتروني I encourage the formal government institutions to expand their e-government services					
تحترم وتثق في لمؤسسات الحكومية الرسمية I respect and trust formal government institutions					
تعتقد أن المؤسسات الحكومية الرسمية قادرة على تقديم الخدمات عبر الإنترنت I believe formal government institutions are able to provide online services					
يمكن للحكومة الإلكترونية أن تقلل من السفر لمسافات طويلة للحصول على الخدمات الحكومية E-government can reduce travelling long distances to get the government services					
ستحسن الحكومة الإلكترونية طريقة معيشة المواطنين في المدن النائية جغرافيا من خلال جذب المزيد من الاستثمارات E-government					

	لا أوافق بشدة Strongly Disagree	لا اوافق Disagree	محايد Neutral	أوافق Agree	أوافق بشدة Strongly Agree
will improve citizens' way of living in the remote cities by attracting more investment					

Appendix D: SPSS Frequency Reports

Frequency Table

Q1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	802	100.0	100.0	100.0

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 20	17	2.1	2.1	2.1
	20-30	168	20.9	20.9	23.1
	31-40	249	31.0	31.0	54.1
	41-50	238	29.7	29.7	83.8
	51-60	108	13.5	13.5	97.3
	Over 60	22	2.7	2.7	100.0
	Total	802	100.0	100.0	

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	642	80.0	80.0	80.0
	Female	160	20.0	20.0	100.0
	Total	802	100.0	100.0	

Hometown

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Al-Abyar	1	.1	.1	.1
	Al-Ajailat	20	2.5	2.5	2.6
	Al-Asabaa	3	.4	.4	3.0
	Al-Azaizia	4	.5	.5	3.5
	Al-Baida	15	1.9	1.9	5.4
	Al-Garaboulli	3	.4	.4	5.7
	Al-Gatroon	3	.4	.4	6.1
	Al-Ghaddahia	1	.1	.1	6.2
	Al-Gobba	4	.5	.5	6.7
	Al-Jaghbob	1	.1	.1	6.9
	Al-Jmail	2	.2	.2	7.1
	Al-Jofra	1	.1	.1	7.2

	Al-khoms	1	.1	.1	7.4
	Al-Khoms	13	1.6	1.6	9.0
	Al-Kuffra	1	.1	.1	9.1
	Al-Marrj	2	.2	.2	9.4
	Al-Oainat	1	.1	.1	9.5
	Al-Ryayna	2	.2	.2	9.7
	Al-Shati	8	1.0	1.0	10.7
	Al-Zahra	1	.1	.1	10.8
	Bani-Walid	10	1.2	1.2	12.1
	Benghazi	58	7.2	7.2	19.3
	Derna	5	.6	.6	20.0
	Ejdabia	6	.7	.7	20.7
	Ghaddamis	1	.1	.1	20.8
	Ghat	2	.2	.2	21.1
	Gherian	13	1.6	1.6	22.7
	Houn	4	.5	.5	23.2
	Jado	1	.1	.1	23.3
	Jalo	6	.7	.7	24.1
	Janzour	12	1.5	1.5	25.6
	Kabaoo	1	.1	.1	25.7
	Kaser Kiar	1	.1	.1	25.8
	Misalata	4	.5	.5	26.3
	Mosrata	113	14.1	14.1	40.4
	Murzok	1	.1	.1	40.5
	New Brega	2	.2	.2	40.8
	Oubari	3	.4	.4	41.1
	Oujla	2	.2	.2	41.4
	Regdalin	3	.4	.4	41.8
	Sabha	24	3.0	3.0	44.8
	Sabrata	9	1.1	1.1	45.9
	Shahaat	2	.2	.2	46.1
	Sirte	14	1.7	1.7	47.9
	Soloug	2	.2	.2	48.1
	Surman	6	.7	.7	48.9
	Tajora	4	.5	.5	49.4
	Tarhuna	9	1.1	1.1	50.5
	Tieji	2	.2	.2	50.7
	Tomzine	2	.2	.2	51.0
	Tripoli	320	39.9	39.9	90.9
	Tubrok	5	.6	.6	91.5
	Wadi Otba	2	.2	.2	91.8
	Wadi Zamzam	1	.1	.1	91.9
	Yefren	3	.4	.4	92.3
	Zawia	37	4.6	4.6	96.9
	Zliten	20	2.5	2.5	99.4
	Zulton	1	.1	.1	99.5
	Zwara	2	.2	.2	99.8
	Zwila	2	.2	.2	100.0
	Total	802	100.0	100.0	

Education Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High Diploma	115	14.3	14.3	14.3
	Secondary School or equivalent	60	7.5	7.5	21.8
	Belo Secondary School	8	1.0	1.0	22.8
	Master	265	33.0	33.0	55.9
	PhD	117	14.6	14.6	70.4
	BSc or equivalent	237	29.6	29.6	100.0
	Total	802	100.0	100.0	

Years of Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 5 Years	210	26.2	26.2	26.2
	5-10	182	22.7	22.7	48.9
	11-15	116	14.5	14.5	63.3
	16-20	112	14.0	14.0	77.3
	21-25	61	7.6	7.6	84.9
	26-30	59	7.4	7.4	92.3
	Over 30 Years	62	7.7	7.7	100.0
	Total	802	100.0	100.0	

Internet Usage Rate

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Once a month	8	1.0	1.0	1.0
	Once a week	9	1.1	1.1	2.1
	Several times a week	65	8.1	8.1	10.2
	Every day	366	45.6	45.6	55.9
	Several times a day	354	44.1	44.1	100.0
	Total	802	100.0	100.0	

Watching News

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	142	17.7	17.7	17.7
	For Watching News	660	82.3	82.3	100.0
	Total	802	100.0	100.0	

Keep in contact with family and friends

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	170	21.2	21.2	21.2
	1	632	78.8	78.8	100.0

	Total	802	100.0	100.0	

To Pay bills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	696	86.8	86.8	86.8
	1	106	13.2	13.2	100.0
	Total	802	100.0	100.0	

Online banking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	681	84.9	84.9	84.9
	1	121	15.1	15.1	100.0
	Total	802	100.0	100.0	

To access Gov Services

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	603	75.2	75.2	75.2
	1	199	24.8	24.8	100.0
	Total	802	100.0	100.0	

For Entertainment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	461	57.5	57.5	57.5
	1	341	42.5	42.5	100.0
	Total	802	100.0	100.0	

Mobile Phones

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	118	14.7	14.7	14.7
	Mobile Phones	684	85.3	85.3	100.0
	Total	802	100.0	100.0	

Computers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	264	32.9	32.9	32.9
	1	538	67.1	67.1	100.0
	Total	802	100.0	100.0	

Tablet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	734	91.5	91.5	91.5
	1	68	8.5	8.5	100.0
	Total	802	100.0	100.0	

Ipad

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	702	87.5	87.5	87.5
	1	100	12.5	12.5	100.0
	Total	802	100.0	100.0	

Others

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	789	98.4	98.4	98.4
	Laptop	11	1.4	1.4	99.8
	Smart TV	2	.2	.2	100.0
	Total	802	100.0	100.0	

By Internet provider Via my mobile phone

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	462	57.6	57.6	57.6
	Yes	340	42.4	42.4	100.0
	Total	802	100.0	100.0	

By Internet provider using my computer at home - ADSL

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	208	25.9	25.9	25.9
	Yes	594	74.1	74.1	100.0
	Total	802	100.0	100.0	

By Internet provider using Internet Café

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	695	86.7	86.7	86.7
	Yes	107	13.3	13.3	100.0
	Total	802	100.0	100.0	

By internet service provider at work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	574	71.6	71.6	71.6
	Yes	228	28.4	28.4	100.0
	Total	802	100.0	100.0	

Via my next door neighbours

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	792	98.8	98.8	98.8
	Yes	10	1.2	1.2	100.0
	Total	802	100.0	100.0	

Via my friends

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	773	96.4	96.4	96.4
	Yes	29	3.6	3.6	100.0
	Total	802	100.0	100.0	

I cannot access the internet at all

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	799	99.6	99.6	99.6
	Yes	3	.4	.4	100.0
	Total	802	100.0	100.0	

Others

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	716	89.3	89.3	89.3
	LibyaMax	77	9.6	9.6	98.9
	Private Dish	9	1.1	1.1	100.0
	Total	802	100.0	100.0	

Electrical Cut-off

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	205	25.6	25.6	25.6
	Very Often	284	35.4	35.4	61.0
	Sometimes	246	30.7	30.7	91.6
	Rarely	44	5.5	5.5	97.1
	Never	23	2.9	2.9	100.0

	Total	802	100.0	100.0	

Loss of Mobile signal

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	62	7.7	7.7	7.7
	Very Often	195	24.3	24.3	32.0
	Sometimes	392	48.9	48.9	80.9
	Rarely	128	16.0	16.0	96.9
	Never	25	3.1	3.1	100.0
	Total	802	100.0	100.0	

Loss of access to the Internet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	56	7.0	7.0	7.0
	Very Often	182	22.7	22.7	29.7
	Sometimes	426	53.1	53.1	82.8
	Rarely	121	15.1	15.1	97.9
	Never	17	2.1	2.1	100.0
	Total	802	100.0	100.0	

Share electricity with neighbours

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	29	3.6	3.6	3.6
	Very Often	41	5.1	5.1	8.7
	Sometimes	99	12.3	12.3	21.1
	Rarely	140	17.5	17.5	38.5
	Never	493	61.5	61.5	100.0
	Total	802	100.0	100.0	

Share Internet with friends

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	44	5.5	5.5	5.5
	Very Often	87	10.8	10.8	16.3
	Sometimes	232	28.9	28.9	45.3
	Rarely	178	22.2	22.2	67.5
	Never	261	32.5	32.5	100.0
	Total	802	100.0	100.0	

Share Internet with relatives

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	59	7.4	7.4	7.4
	Very Often	94	11.7	11.7	19.1
	Sometimes	215	26.8	26.8	45.9
	Rarely	162	20.2	20.2	66.1
	Never	272	33.9	33.9	100.0
	Total	802	100.0	100.0	

Share Internet with neighbours

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	22	2.7	2.7	2.7
	Very Often	38	4.7	4.7	7.5
	Sometimes	111	13.8	13.8	21.3
	Rarely	154	19.2	19.2	40.5
	Never	477	59.5	59.5	100.0
	Total	802	100.0	100.0	

Using private power supply

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	137	17.1	17.1	17.1
	Very Often	140	17.5	17.5	34.5
	Sometimes	177	22.1	22.1	56.6
	Rarely	79	9.9	9.9	66.5
	Never	269	33.5	33.5	100.0
	Total	802	100.0	100.0	

Using e-passport reservation system by my self

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	257	32.0	32.0	32.0
	1	545	68.0	68.0	100.0
	Total	802	100.0	100.0	

Through friends

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	628	78.3	78.3	78.3
	1	174	21.7	21.7	100.0
	Total	802	100.0	100.0	

Through relatives in another city

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	745	92.9	92.9	92.9
	1	57	7.1	7.1	100.0
	Total	802	100.0	100.0	

Through one of my family members

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	675	84.2	84.2	84.2
	1	127	15.8	15.8	100.0
	Total	802	100.0	100.0	

I did not apply for e-passport yet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	802	100.0	100.0	100.0

Others

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.1	.1	.1
	0	797	99.4	99.4	99.5
	I applied befor the Online sys	1	.1	.1	99.6
	It's bad way in libya since th	1	.1	.1	99.8
	Libyan Embassy in Malaysia	2	.2	.2	100.0
	Total	802	100.0	100.0	

Reversed Questions 5-1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	156	19.5	19.5	19.5
	Very Often	98	12.2	12.2	31.7
	Sometimes	207	25.8	25.8	57.5
	Rarely	208	25.9	25.9	83.4
	Never	133	16.6	16.6	100.0
	Total	802	100.0	100.0	

ReversedQ16.2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	234	29.2	29.2	29.2
	Disagree	395	49.3	49.3	78.4

	Neutral	101	12.6	12.6	91.0
	Agree	46	5.7	5.7	96.8
	Strongly Agree	26	3.2	3.2	100.0
	Total	802	100.0	100.0	

ReversedQ18.3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	74	9.2	9.2	9.2
	Disagree	346	43.1	43.1	52.4
	Neutral	193	24.1	24.1	76.4
	Agree	152	19.0	19.0	95.4
	Strongly Agree	37	4.6	4.6	100.0
	Total	802	100.0	100.0	

ReversedQ20.3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	221	27.6	27.6	27.6
	Disagree	426	53.1	53.1	80.7
	Neutral	108	13.5	13.5	94.1
	Agree	38	4.7	4.7	98.9
	Strongly Agree	9	1.1	1.1	100.0
	Total	802	100.0	100.0	

ReversedQ20.2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	32	4.0	4.0	4.0
	Disagree	174	21.7	21.7	25.7
	Neutral	173	21.6	21.6	47.3
	Agree	296	36.9	36.9	84.2
	Strongly Agree	127	15.8	15.8	100.0
	Total	802	100.0	100.0	

Infrastructure -Q1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	23	2.9	2.9	2.9
	2	44	5.5	5.5	8.4
	3	246	30.7	30.7	39.0
	4	284	35.4	35.4	74.4
	5	205	25.6	25.6	100.0
	Total	802	100.0	100.0	

Infrastructure -Q2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	25	3.1	3.1	3.1
	2	128	16.0	16.0	19.1
	3	392	48.9	48.9	68.0
	4	195	24.3	24.3	92.3
	5	62	7.7	7.7	100.0
	Total	802	100.0	100.0	

Infrastructure -Q3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	17	2.1	2.1	2.1
	2	121	15.1	15.1	17.2
	3	426	53.1	53.1	70.3
	4	182	22.7	22.7	93.0
	5	56	7.0	7.0	100.0
	Total	802	100.0	100.0	

Social Collaboration- Q1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	493	61.5	61.5	61.5
	2	140	17.5	17.5	78.9
	3	99	12.3	12.3	91.3
	4	41	5.1	5.1	96.4
	5	29	3.6	3.6	100.0
	Total	802	100.0	100.0	

Social Collaboration- Q2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	261	32.5	32.5	32.5
	2	178	22.2	22.2	54.7
	3	232	28.9	28.9	83.7
	4	87	10.8	10.8	94.5
	5	44	5.5	5.5	100.0
	Total	802	100.0	100.0	

Social Collaboration- Q3

		Frequency	Percent	Valid Percent	Cumulative Percent

Valid	1	272	33.9	33.9	33.9
	2	162	20.2	20.2	54.1
	3	215	26.8	26.8	80.9
	4	94	11.7	11.7	92.6
	5	59	7.4	7.4	100.0
	Total	802	100.0	100.0	

Social Collaboration- Q4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	477	59.5	59.5	59.5
	2	154	19.2	19.2	78.7
	3	111	13.8	13.8	92.5
	4	38	4.7	4.7	97.3
	5	22	2.7	2.7	100.0
	Total	802	100.0	100.0	

Social Collaboration- Q5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	269	33.5	33.5	33.5
	2	79	9.9	9.9	43.4
	3	177	22.1	22.1	65.5
	4	140	17.5	17.5	82.9
	5	137	17.1	17.1	100.0
	Total	802	100.0	100.0	

Citizens Safety - Q1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	452	56.4	56.4	56.4
	2	151	18.8	18.8	75.2
	3	112	14.0	14.0	89.2
	4	41	5.1	5.1	94.3
	5	46	5.7	5.7	100.0
	Total	802	100.0	100.0	

Citizens Safety - Q2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	241	30.0	30.0	30.0
	2	127	15.8	15.8	45.9
	3	204	25.4	25.4	71.3
	4	112	14.0	14.0	85.3
	5	118	14.7	14.7	100.0

	Total	802	100.0	100.0	

Citizens Safety - Q3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	213	26.6	26.6	26.6
	2	113	14.1	14.1	40.6
	3	154	19.2	19.2	59.9
	4	100	12.5	12.5	72.3
	5	222	27.7	27.7	100.0
	Total	802	100.0	100.0	

Citizens Safety - Q4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	383	47.8	47.8	47.8
	2	167	20.8	20.8	68.6
	3	131	16.3	16.3	84.9
	4	52	6.5	6.5	91.4
	5	69	8.6	8.6	100.0
	Total	802	100.0	100.0	

Citizens Safety - Q5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	84	10.5	10.5	10.5
	2	58	7.2	7.2	17.7
	3	141	17.6	17.6	35.3
	4	219	27.3	27.3	62.6
	5	300	37.4	37.4	100.0
	Total	802	100.0	100.0	

Citizens Safety - Q6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	156	19.5	19.5	19.5
	2	98	12.2	12.2	31.7
	3	207	25.8	25.8	57.5
	4	208	25.9	25.9	83.4
	5	133	16.6	16.6	100.0
	Total	802	100.0	100.0	

Trust Government - Q1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	243	30.3	30.3	30.3
	2	234	29.2	29.2	59.5
	3	215	26.8	26.8	86.3
	4	79	9.9	9.9	96.1
	5	31	3.9	3.9	100.0
	Total	802	100.0	100.0	

Trust Government - Q2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	180	22.4	22.4	22.4
	2	253	31.5	31.5	54.0
	3	259	32.3	32.3	86.3
	4	77	9.6	9.6	95.9
	5	33	4.1	4.1	100.0
	Total	802	100.0	100.0	

Trust Government - Q3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	207	25.8	25.8	25.8
	2	227	28.3	28.3	54.1
	3	243	30.3	30.3	84.4
	4	98	12.2	12.2	96.6
	5	27	3.4	3.4	100.0
	Total	802	100.0	100.0	

Trust Government - Q4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	120	15.0	15.0	15.0
	2	161	20.1	20.1	35.0
	3	299	37.3	37.3	72.3
	4	177	22.1	22.1	94.4
	5	45	5.6	5.6	100.0
	Total	802	100.0	100.0	

Trust Government & Inst Commitment- Q5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	74	9.2	9.2	9.2
	2	100	12.5	12.5	21.7
	3	252	31.4	31.4	53.1

	4	250	31.2	31.2	84.3
	5	126	15.7	15.7	100.0
	Total	802	100.0	100.0	

Corruption - Q1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	158	19.7	19.7	19.7
	2	158	19.7	19.7	39.4
	3	227	28.3	28.3	67.7
	4	145	18.1	18.1	85.8
	5	114	14.2	14.2	100.0
	Total	802	100.0	100.0	

Corruption - Q2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	74	9.2	9.2	9.2
	2	62	7.7	7.7	17.0
	3	184	22.9	22.9	39.9
	4	237	29.6	29.6	69.5
	5	245	30.5	30.5	100.0
	Total	802	100.0	100.0	

Corruption - Q3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	140	17.5	17.5	17.5
	2	130	16.2	16.2	33.7
	3	225	28.1	28.1	61.7
	4	182	22.7	22.7	84.4
	5	125	15.6	15.6	100.0
	Total	802	100.0	100.0	

Corruption - Q4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	33	4.1	4.1	4.1
	2	50	6.2	6.2	10.3
	3	114	14.2	14.2	24.6
	4	228	28.4	28.4	53.0
	5	377	47.0	47.0	100.0
	Total	802	100.0	100.0	

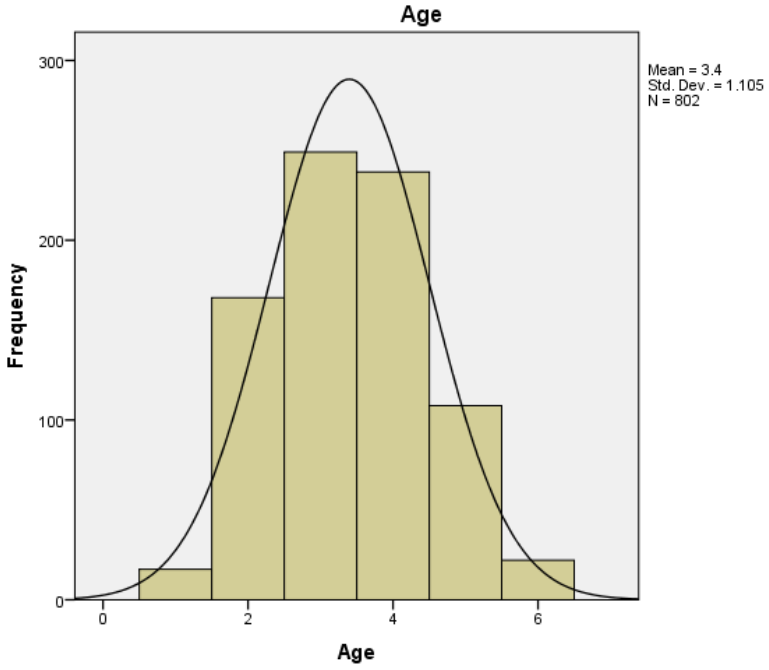
Corruption - Q5

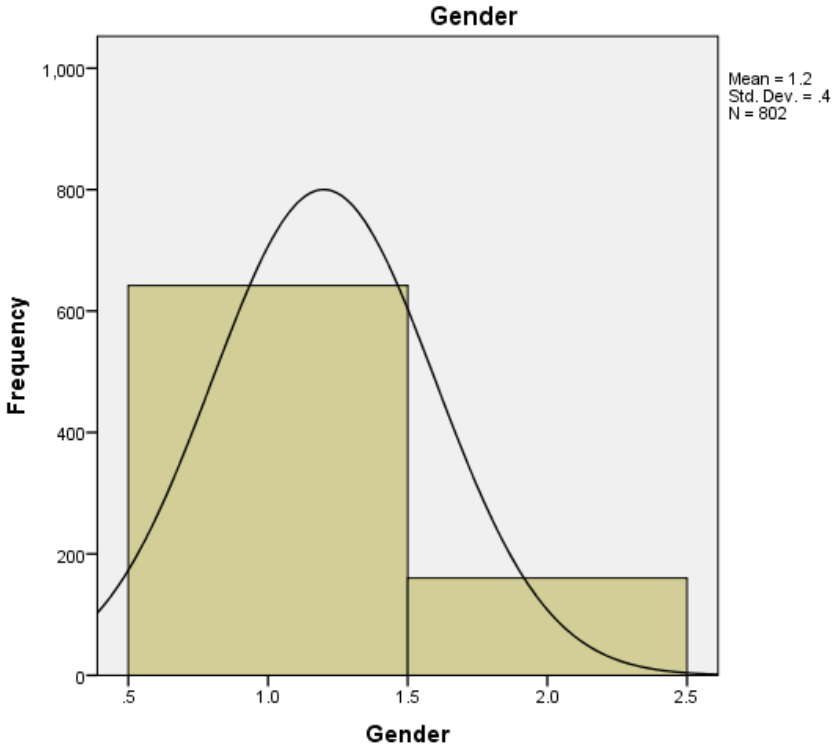
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	113	14.1	14.1	14.1
	2	57	7.1	7.1	21.2
	3	186	23.2	23.2	44.4
	4	221	27.6	27.6	71.9
	5	225	28.1	28.1	100.0
	Total	802	100.0	100.0	

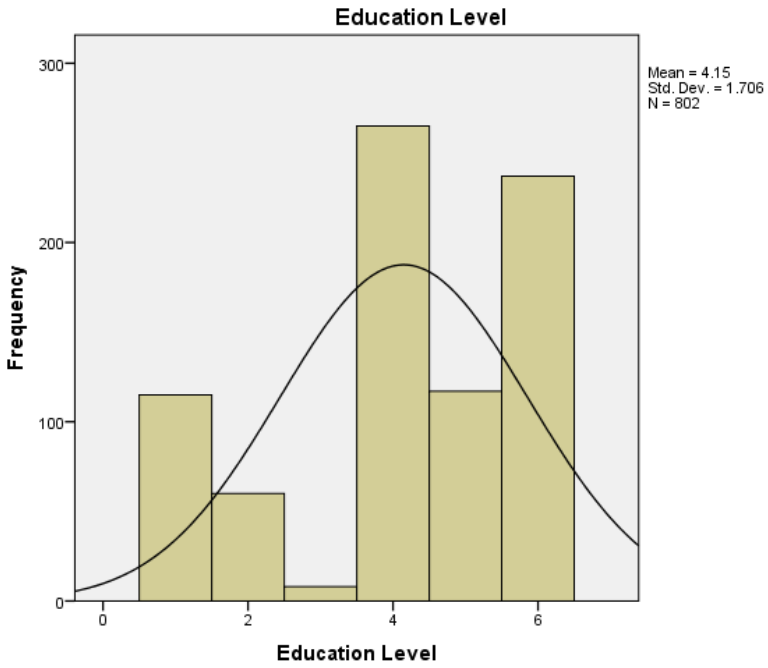
Corruption - Q6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	118	14.7	14.7	14.7
	2	78	9.7	9.7	24.4
	3	241	30.0	30.0	54.5
	4	224	27.9	27.9	82.4
	5	141	17.6	17.6	100.0
	Total	802	100.0	100.0	

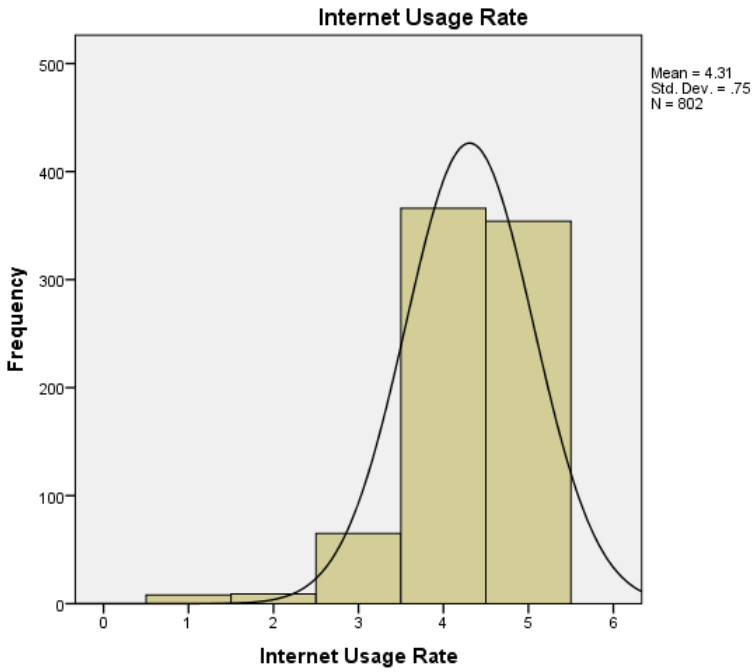
Histogram



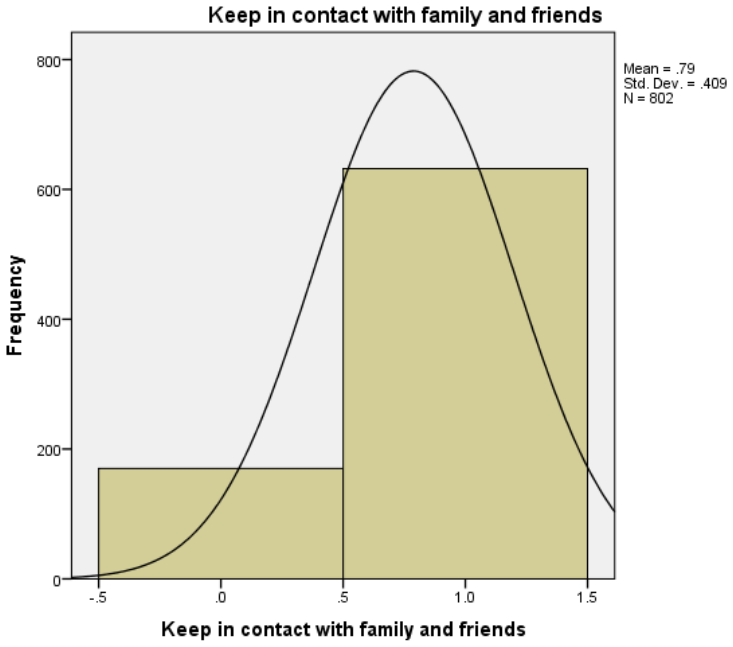

Gender
Mean = 1.2
Std. Dev. = .4
N = 802
Frequency
1,000
800
600
400
200
0
.5
1.0
1.5
2.0
2.5
Gender

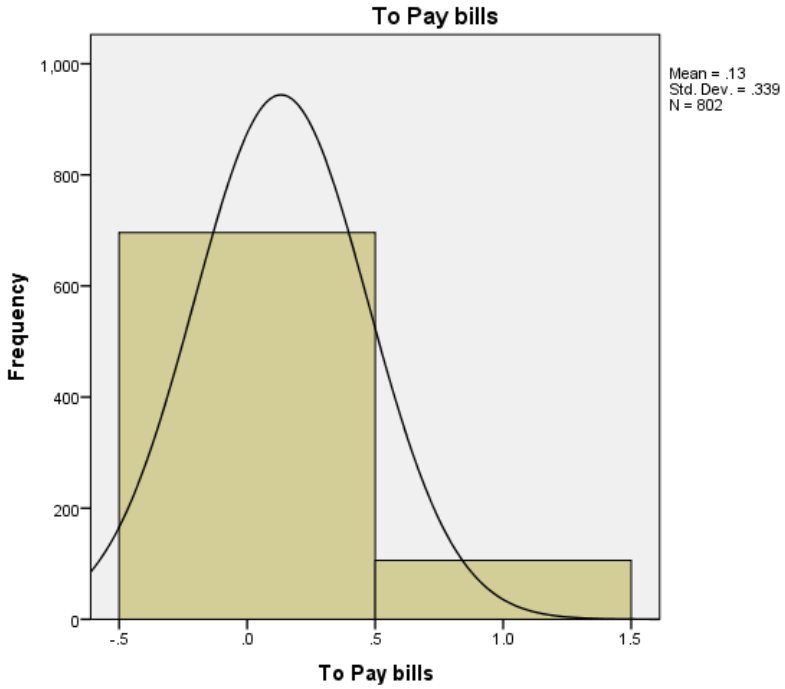

Education Level
Mean = 4.15
Std. Dev. = 1.706
N = 802
Frequency
300
200
100
0
0
2
4
6
Education Level

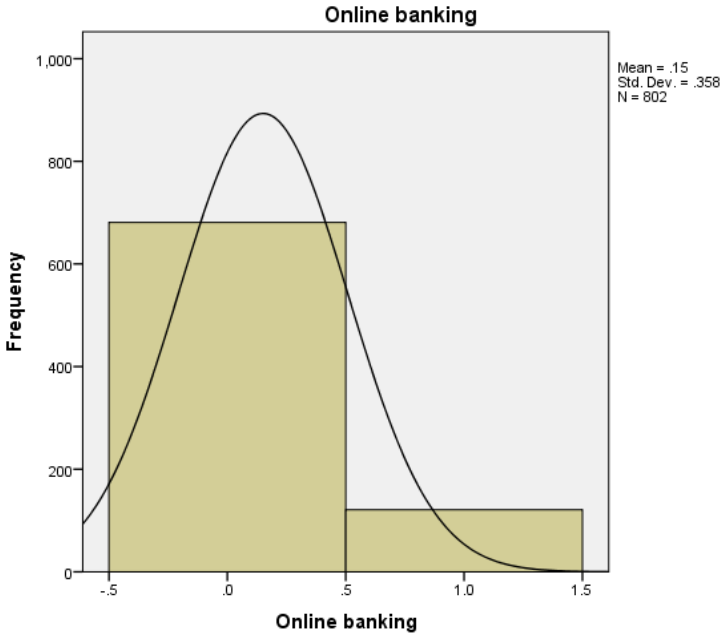

Years of Experience
Mean = 3.07
Std. Dev. = 1.902
N = 802
Frequency
250
200
150
100
50
0
0
2
4
6
8
Years of Experience

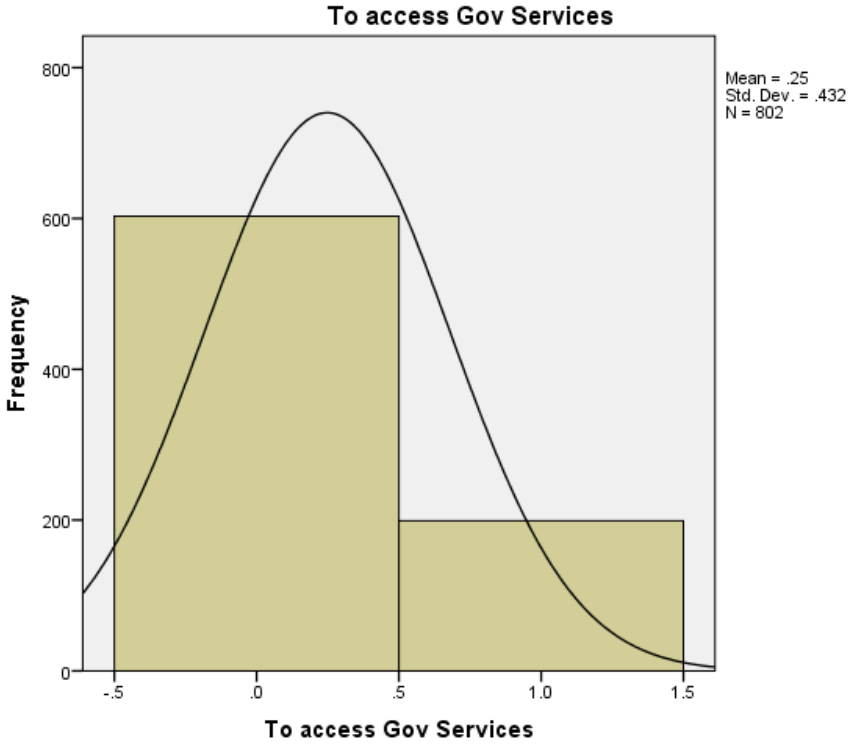

Internet Usage Rate
Mean = 4.31
Std. Dev. = .75
N = 802
Frequency
500
400
300
200
100
0
0
1
2
3
4
5
6
Internet Usage Rate

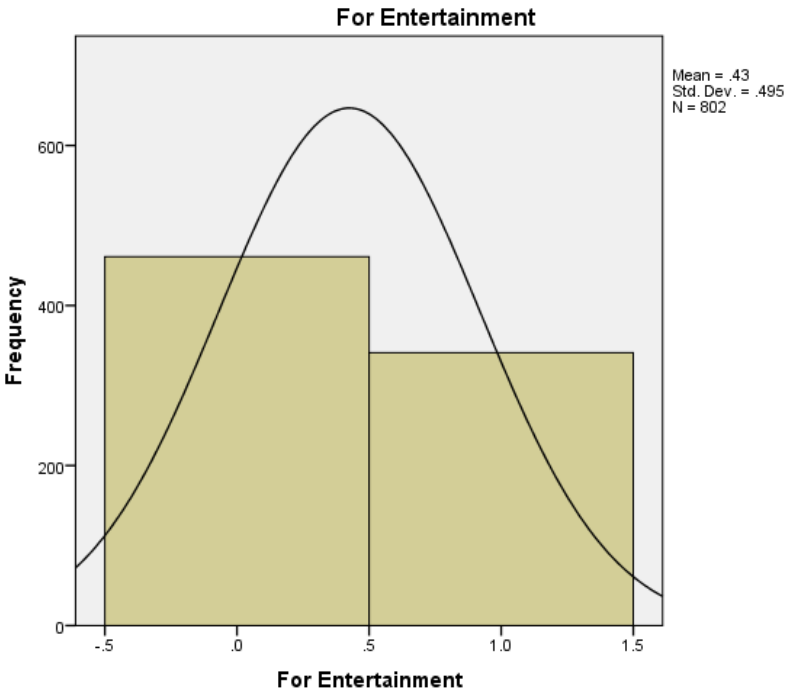

Watching News
Mean = .82
Std. Dev. = .382
N = 802
Frequency
1,000
800
600
400
200
0
-.5
.0
.5
1.0
1.5
Watching News

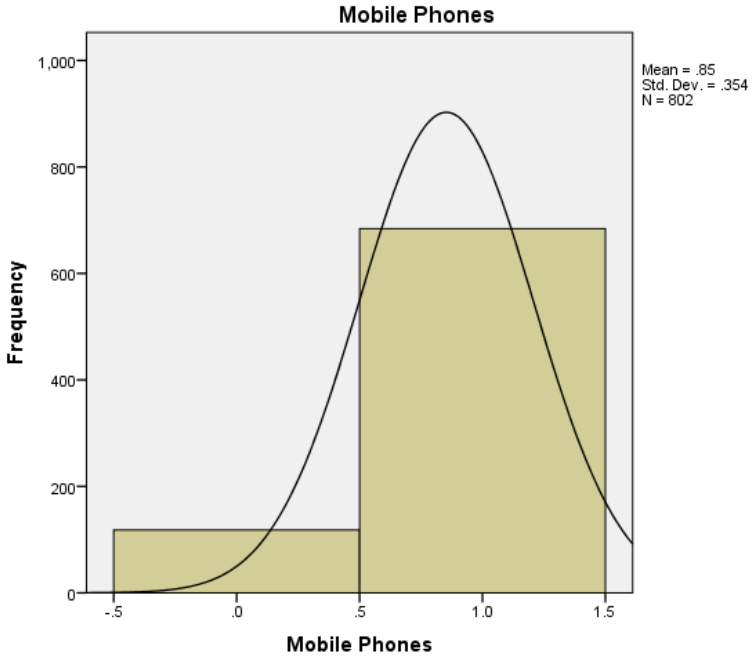

Keep in contact with family and friends
Mean = .79
Std. Dev. = .409
N = 802
Frequency
800
600
400
200
0
-.5
.0
.5
1.0
1.5
Keep in contact with family and friends

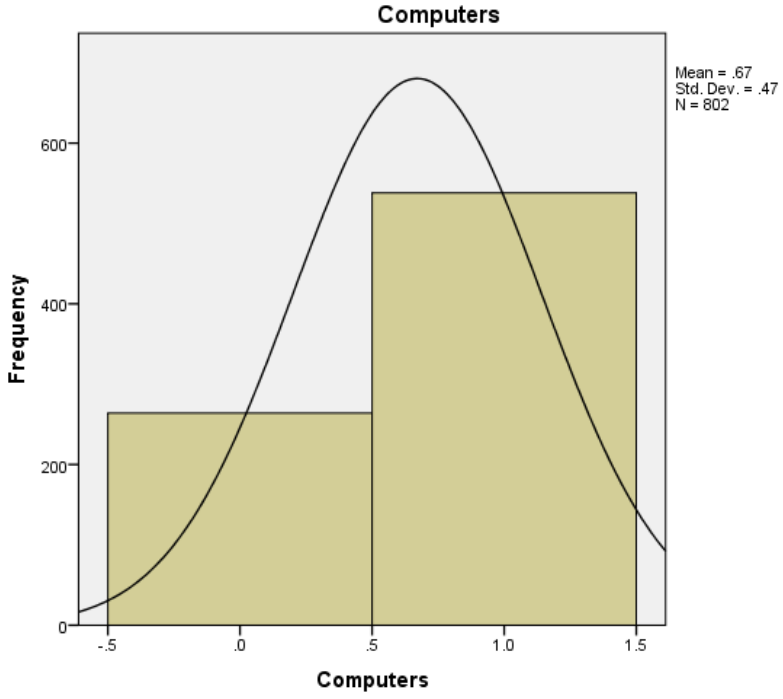

To Pay bills
Mean = .13
Std. Dev. = .339
N = 802
Frequency
1,000
800
600
400
200
0
-.5
.0
.5
1.0
1.5
To Pay bills

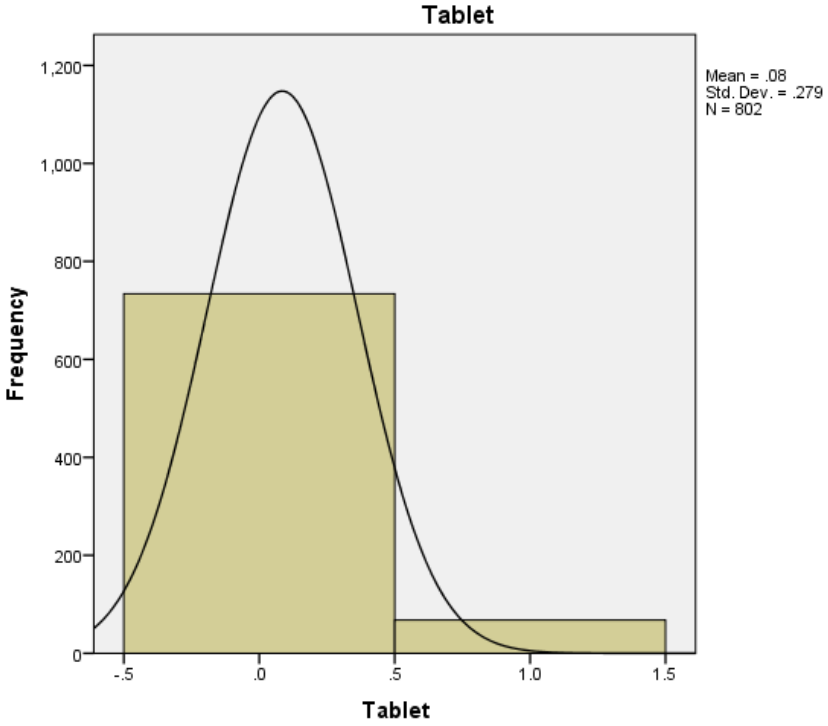

Online banking
Mean = .15
Std. Dev. = .358
N = 802
Frequency
1,000
800
600
400
200
0
-.5
.0
.5
1.0
1.5
Online banking

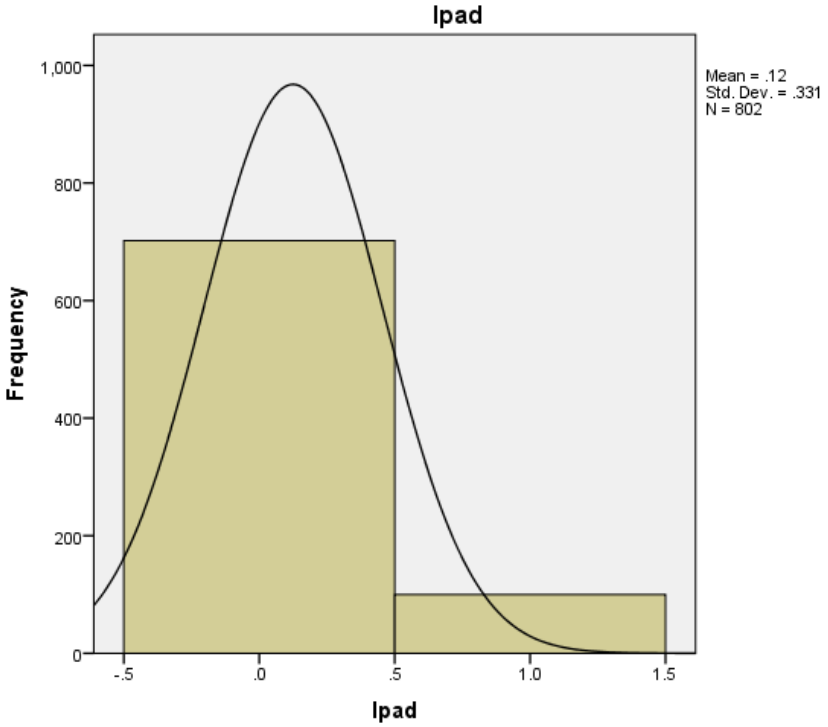

To access Gov Services
Mean = .25
Std. Dev. = .432
N = 802
Frequency
800
600
400
200
0
-.5
.0
.5
1.0
1.5
To access Gov Services

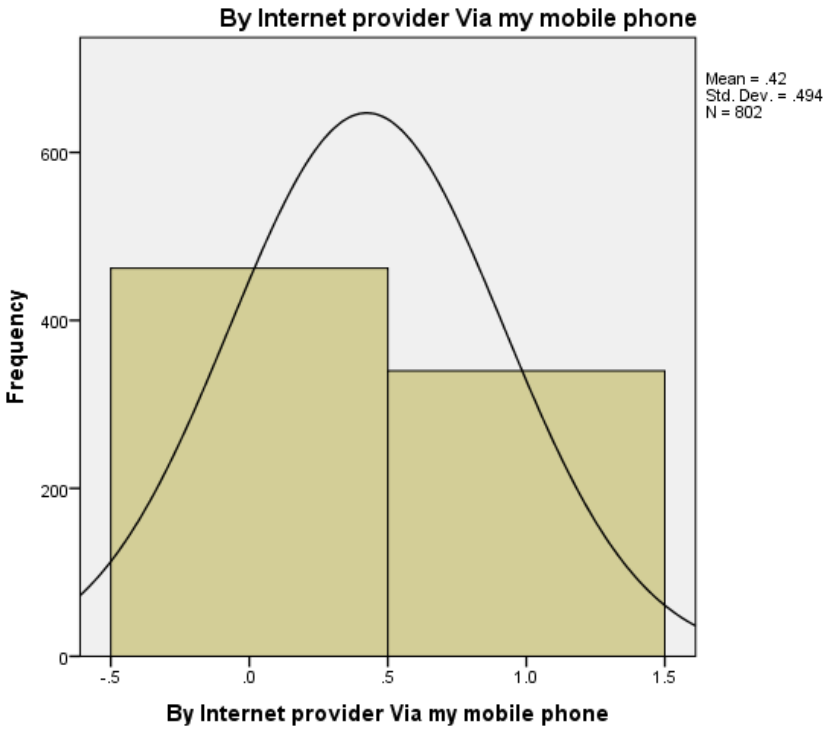

For Entertainment
Mean = .43
Std. Dev. = .495
N = 802
Frequency
600
400
200
0
-.5
.0
.5
1.0
1.5
For Entertainment

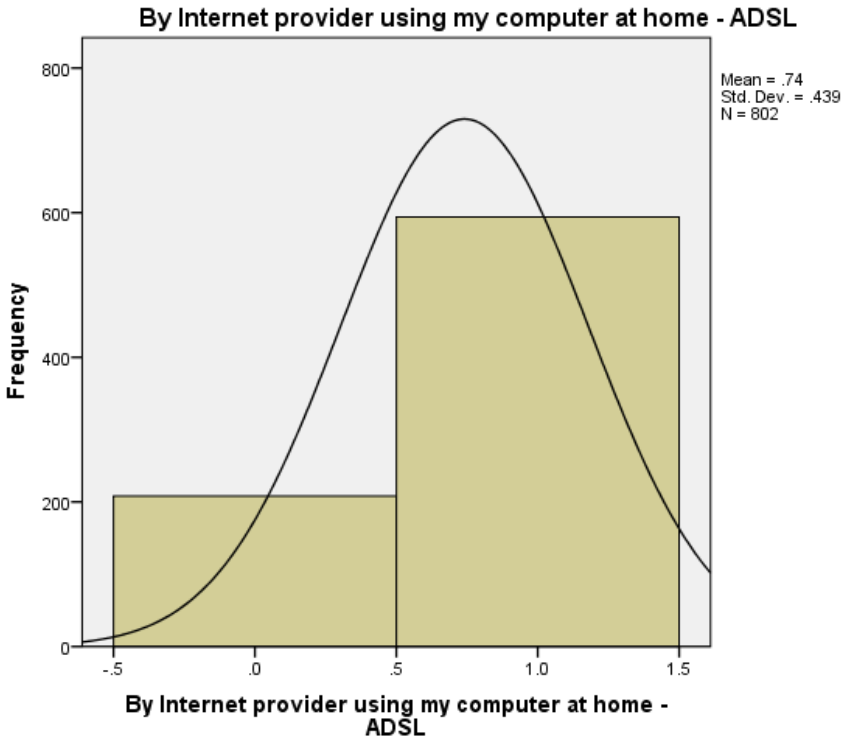

Mobile Phones
Mean = .85
Std. Dev. = .354
N = 802
Frequency
1,000
800
600
400
200
0
-.5
.0
.5
1.0
1.5
Mobile Phones

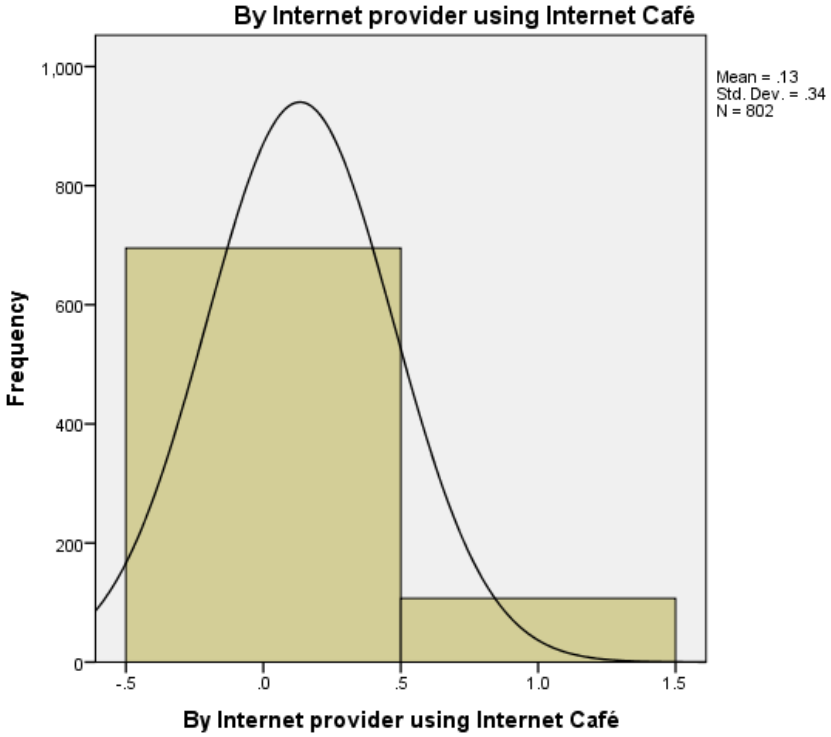

Computers
Mean = .67
Std. Dev. = .47
N = 802
Frequency
600
400
200
0
-.5
.0
.5
1.0
1.5
Computers

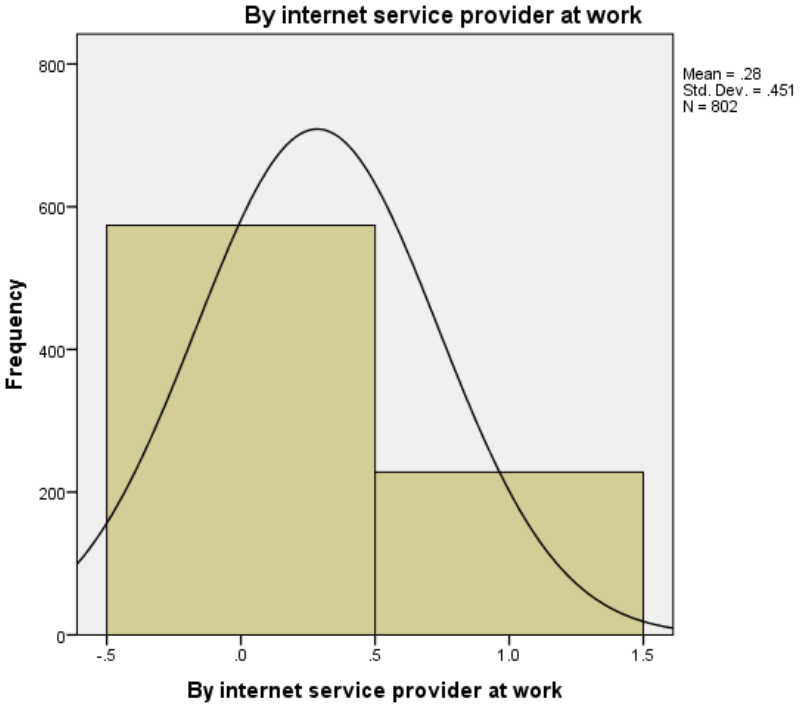

Tablet
Mean = .08
Std. Dev. = .279
N = 802
Frequency
1,200
1,000
800
600
400
200
0
-.5
.0
.5
1.0
1.5
Tablet


Ipad
Mean = .12
Std. Dev. = .331
N = 802
Frequency
1,000
800
600
400
200
0
-.5
.0
.5
1.0
1.5
Ipad

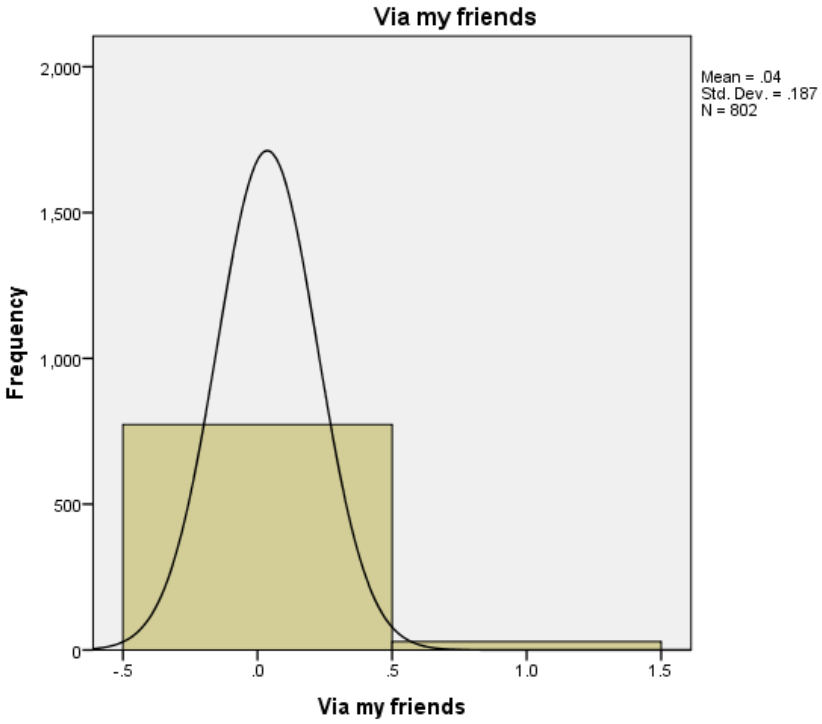

By Internet provider Via my mobile phone
Mean = .42
Std. Dev. = .494
N = 802
Frequency
600
400
200
0
-.5
.0
.5
1.0
1.5
By Internet provider Via my mobile phone

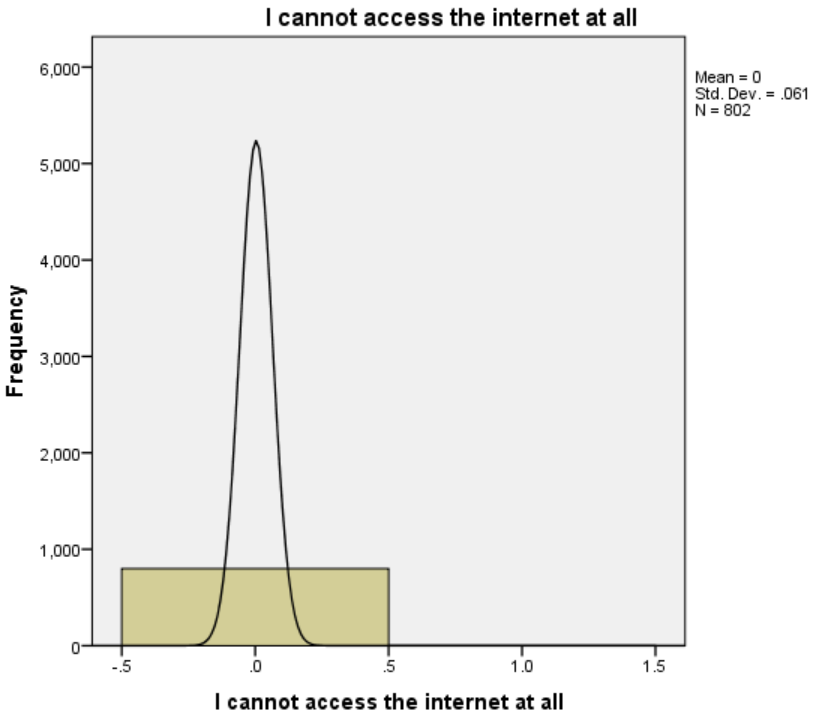

By Internet provider using my computer at home - ADSL
Mean = .74
Std. Dev. = .439
N = 802
Frequency
800
600
400
200
0
-.5
.0
.5
1.0
1.5
By Internet provider using my computer at home - ADSL

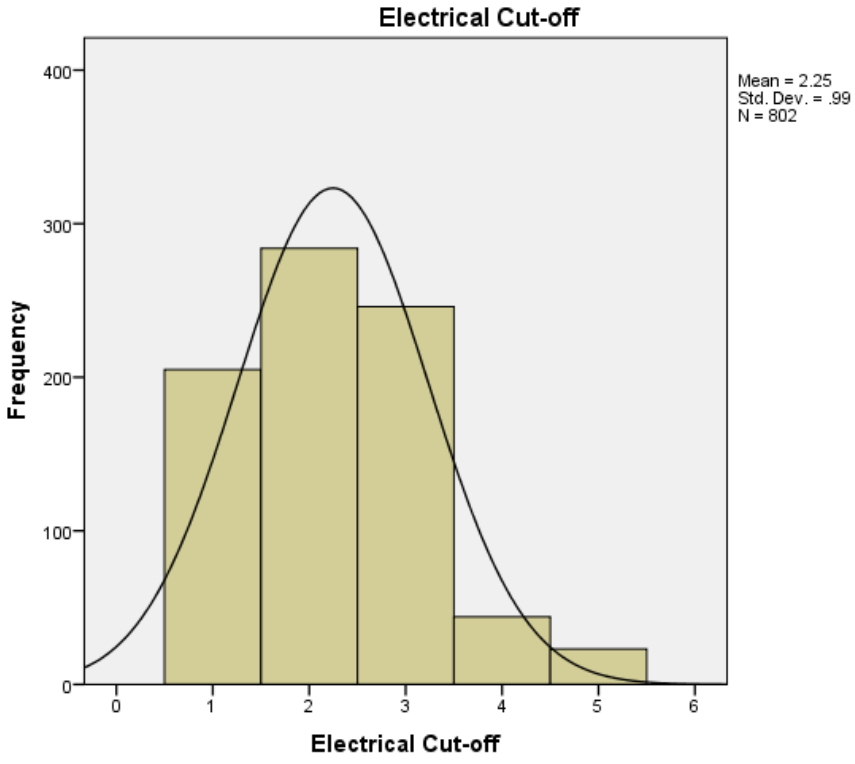

By Internet provider using Internet Café
Mean = .13
Std. Dev. = .34
N = 802
Frequency
1,000
800
600
400
200
0
-.5
.0
.5
1.0
1.5
By Internet provider using Internet Café

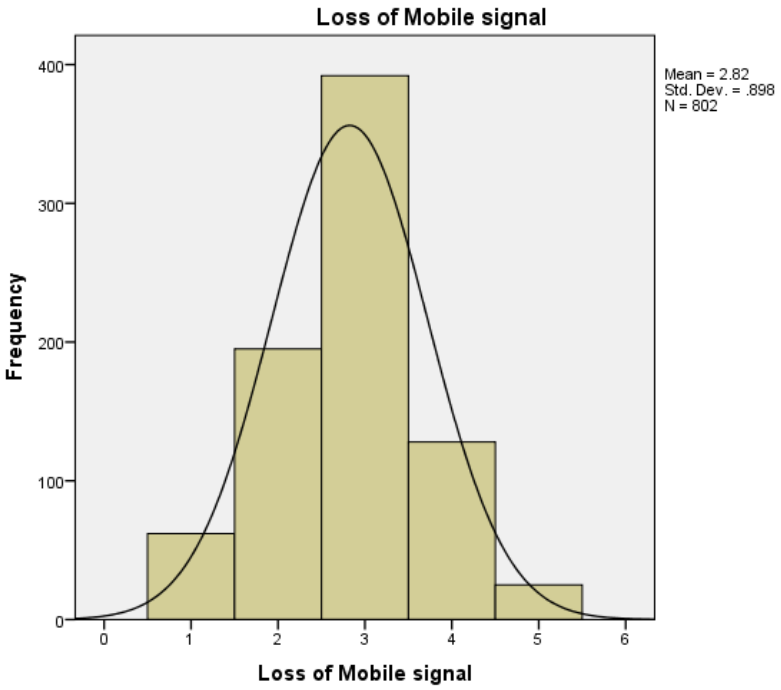

By internet service provider at work
Mean = .28
Std. Dev. = .451
N = 802
Frequency
800
600
400
200
0
-.5
.0
.5
1.0
1.5
By internet service provider at work

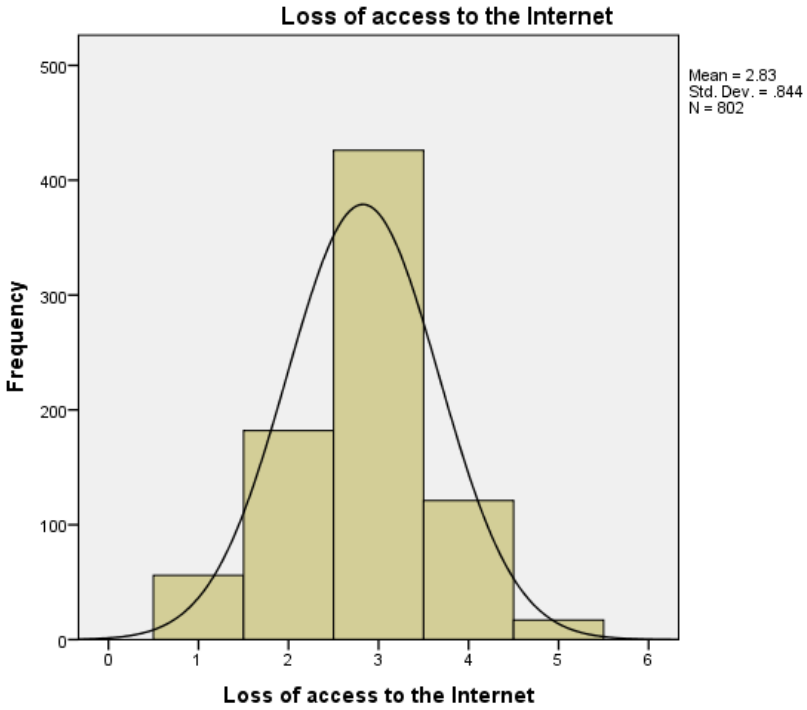

Via my next door neighbours
Mean = .01
Std. Dev. = .111
N = 802
Frequency
3,000
2,000
1,000
0
-.5
.0
.5
1.0
1.5
Via my next door neighbours

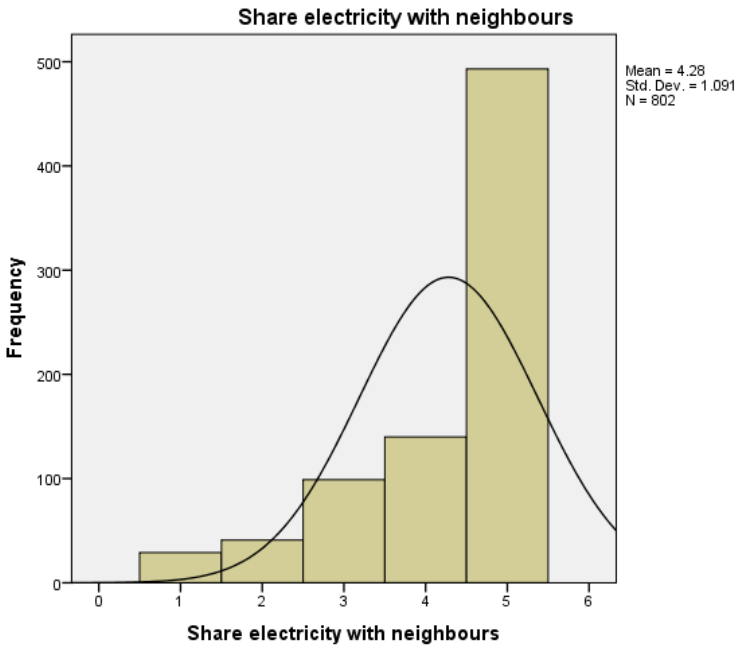

Via my friends
Mean = .04
Std. Dev. = .187
N = 802
Frequency
2,000
1,500
1,000
500
0
-.5
.0
.5
1.0
1.5
Via my friends

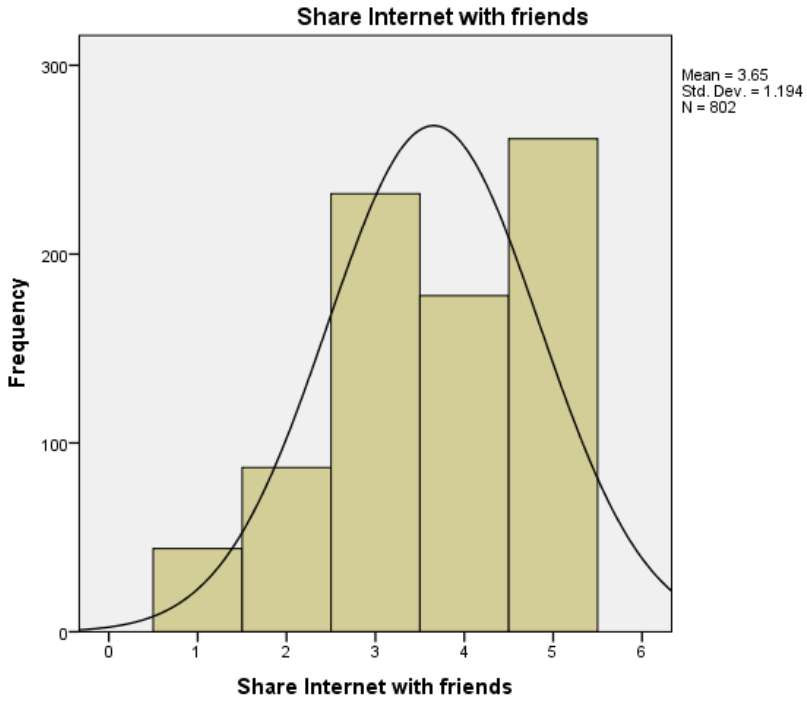

I cannot access the internet at all
Mean = 0
Std. Dev. = .061
N = 802
Frequency
6,000
5,000
4,000
3,000
2,000
1,000
0
-.5
.0
.5
1.0
1.5
I cannot access the internet at all

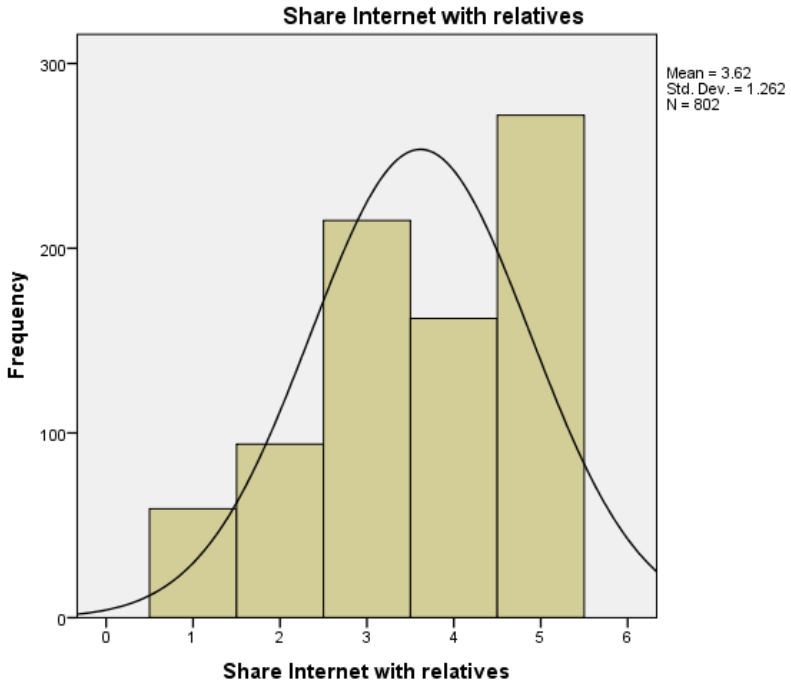

Electrical Cut-off
Mean = 2.25
Std. Dev. = .99
N = 802
Frequency
400
300
200
100
0
0
1
2
3
4
5
6
Electrical Cut-off

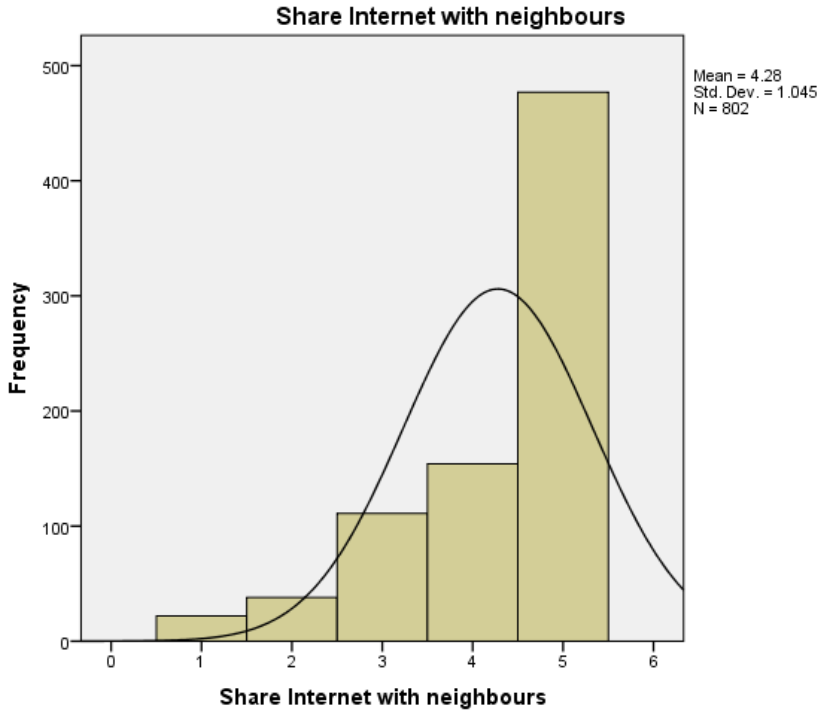

Loss of Mobile signal
Mean = 2.82
Std. Dev. = .898
N = 802
Frequency
400
300
200
100
0
0
1
2
3
4
5
6
Loss of Mobile signal

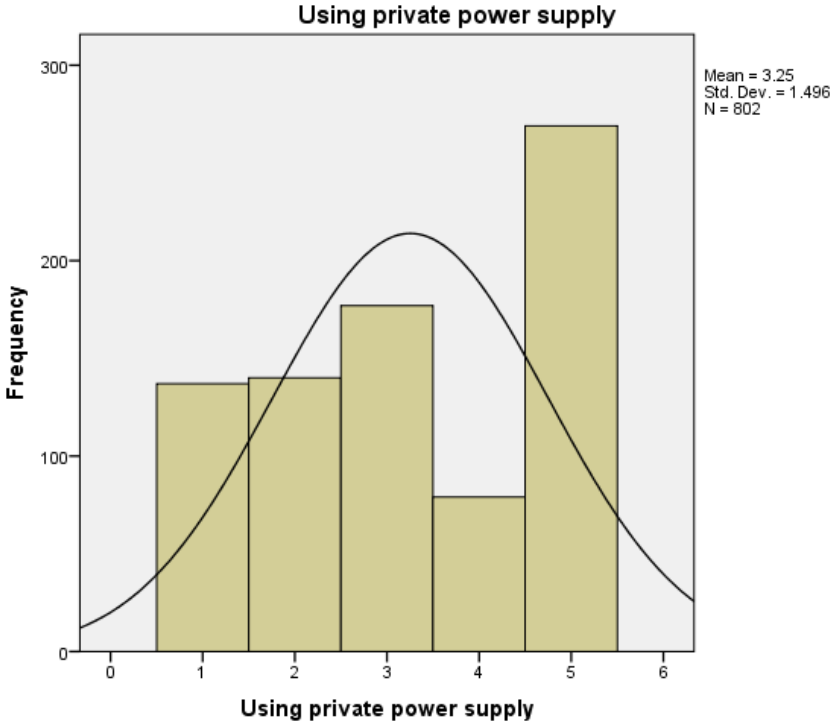

Loss of access to the Internet
Mean = 2.83
Std. Dev. = .844
N = 802
Frequency
500
400
300
200
100
0
0
1
2
3
4
5
6
Loss of access to the Internet

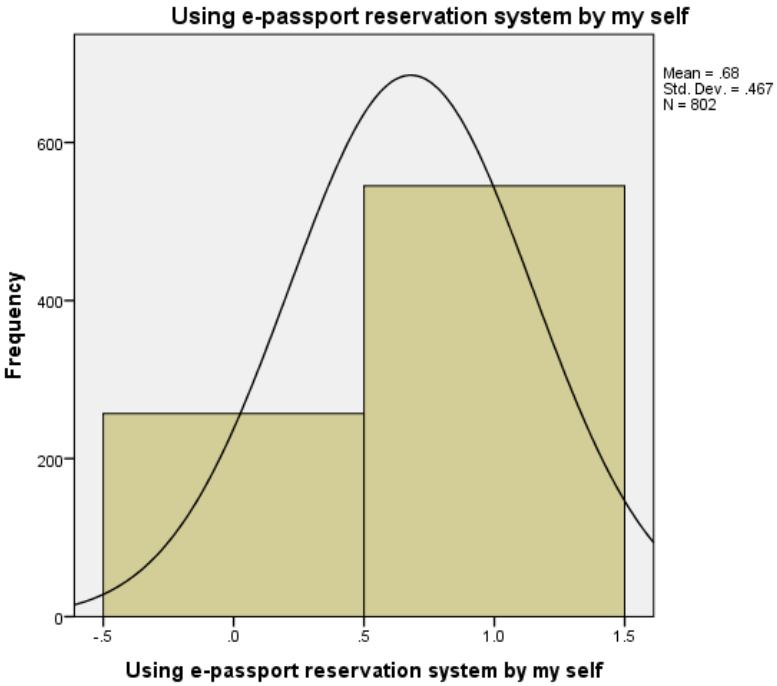

Share electricity with neighbours
Mean = 4.28
Std. Dev. = 1.091
N = 802
Frequency
500
400
300
200
100
0
0
1
2
3
4
5
6
Share electricity with neighbours

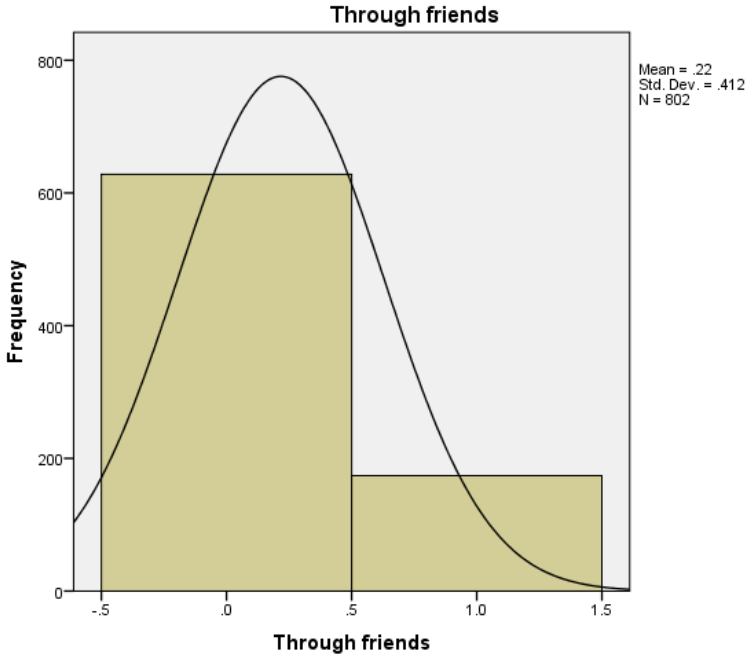

Share Internet with friends
Mean = 3.65
Std. Dev. = 1.194
N = 802
Frequency
300
200
100
0
0
1
2
3
4
5
6
Share Internet with friends

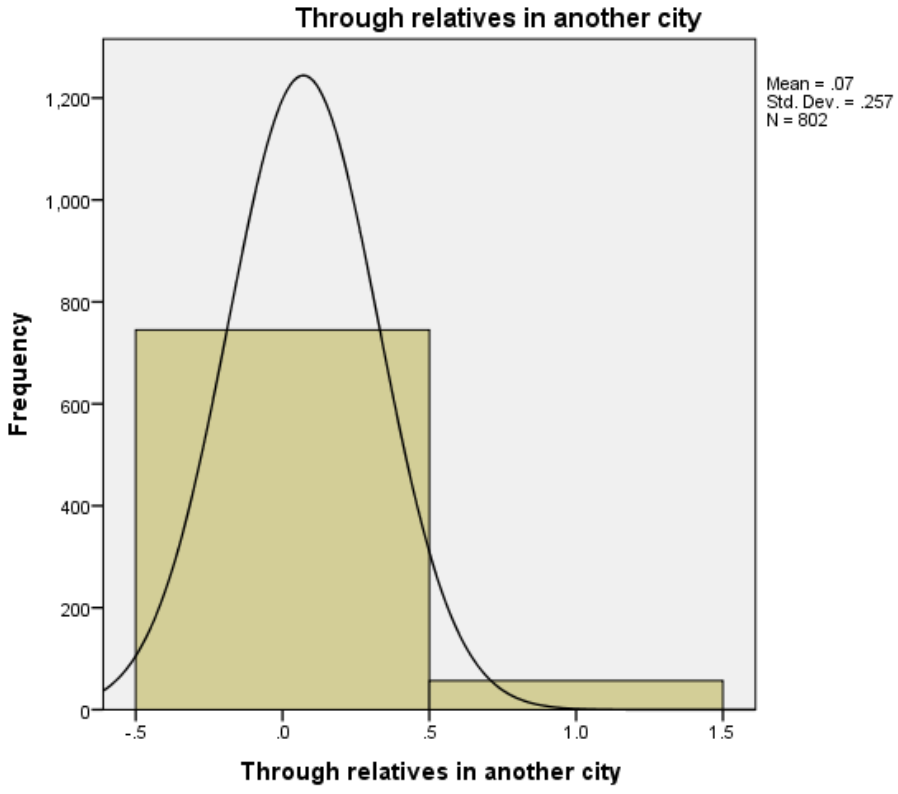

Share Internet with relatives
Mean = 3.62
Std. Dev. = 1.262
N = 802
Frequency
300
200
100
0
0
1
2
3
4
5
6
Share Internet with relatives

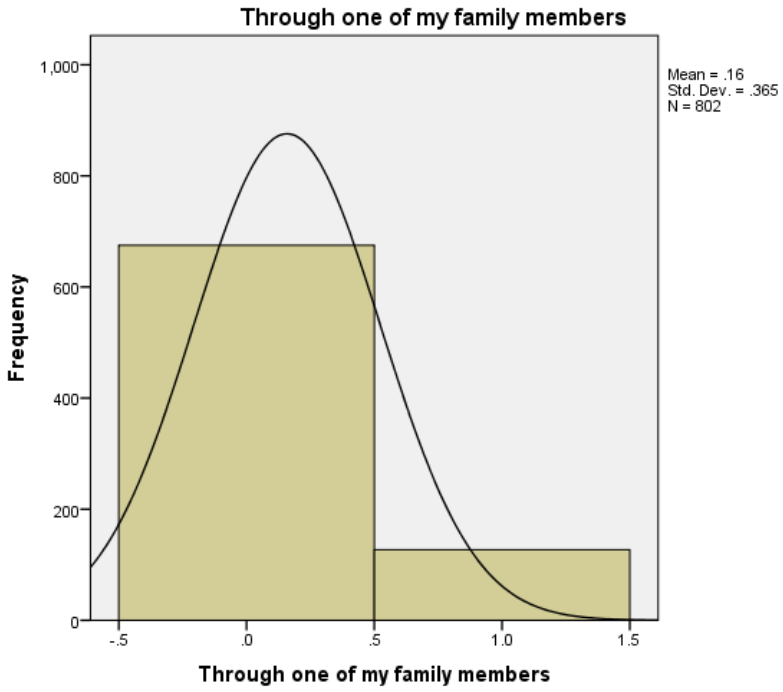

Share Internet with neighbours
Mean = 4.28
Std. Dev. = 1.045
N = 802
Frequency
500
400
300
200
100
0
0
1
2
3
4
5
6
Share Internet with neighbours

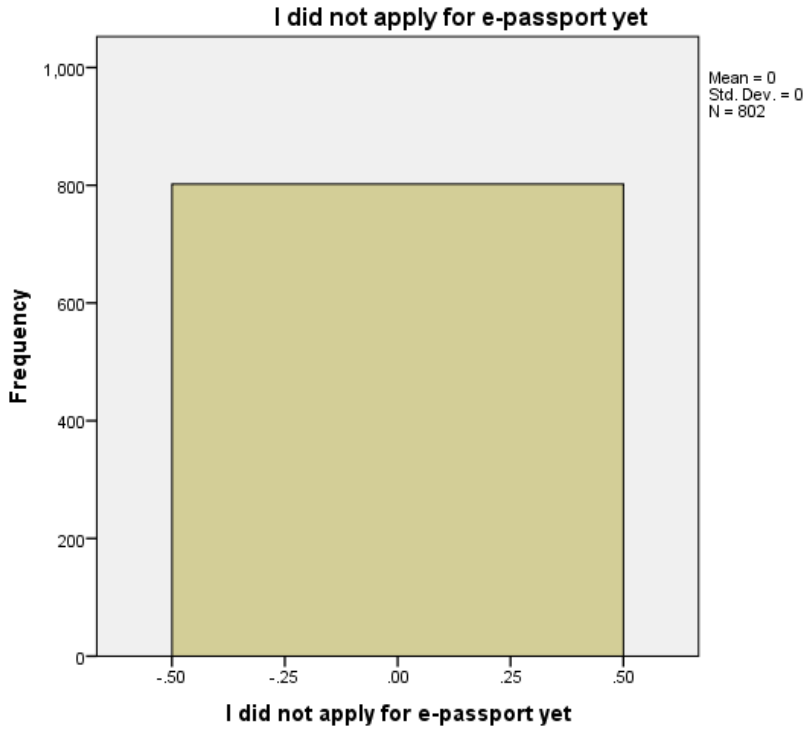

Using private power supply
Mean = 3.25
Std. Dev. = 1.496
N = 802
Frequency
300
200
100
0
0
1
2
3
4
5
6
Using private power supply

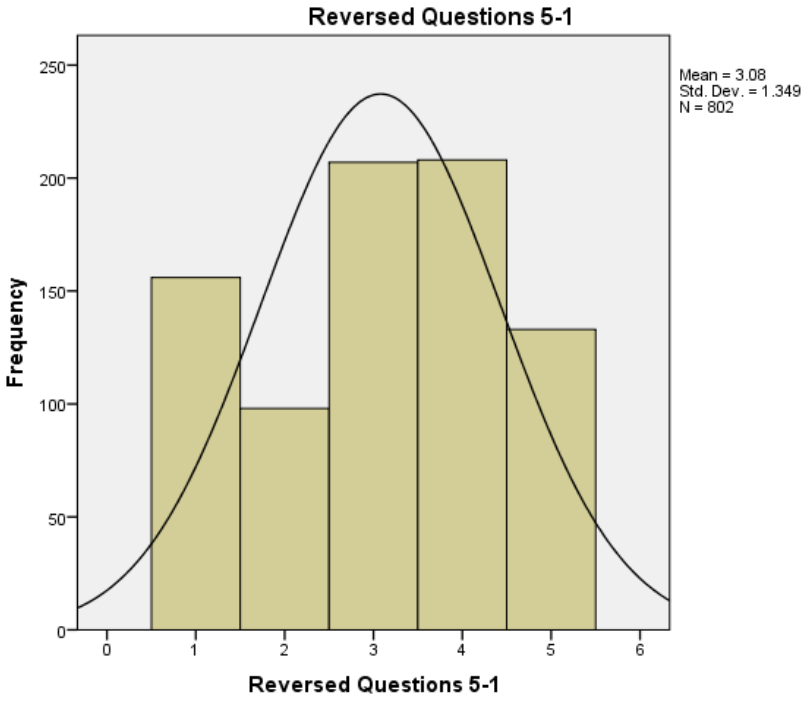

Using e-passport reservation system by my self
Mean = .68
Std. Dev. = .467
N = 802
Frequency
600
400
200
0
-.5
.0
.5
1.0
1.5
Using e-passport reservation system by my self

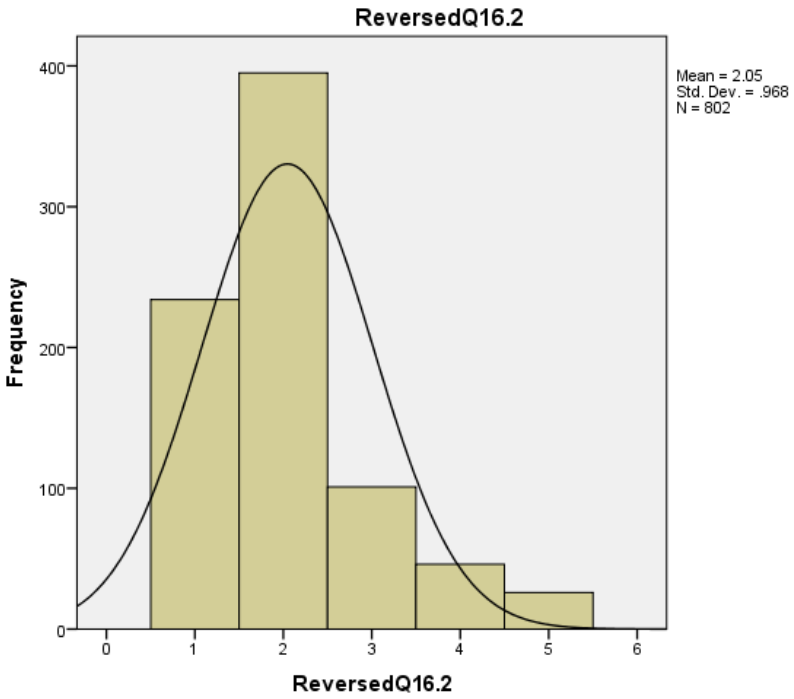

Through friends
Mean = .22
Std. Dev. = .412
N = 802
Frequency
800
600
400
200
0
-.5
.0
.5
1.0
1.5
Through friends

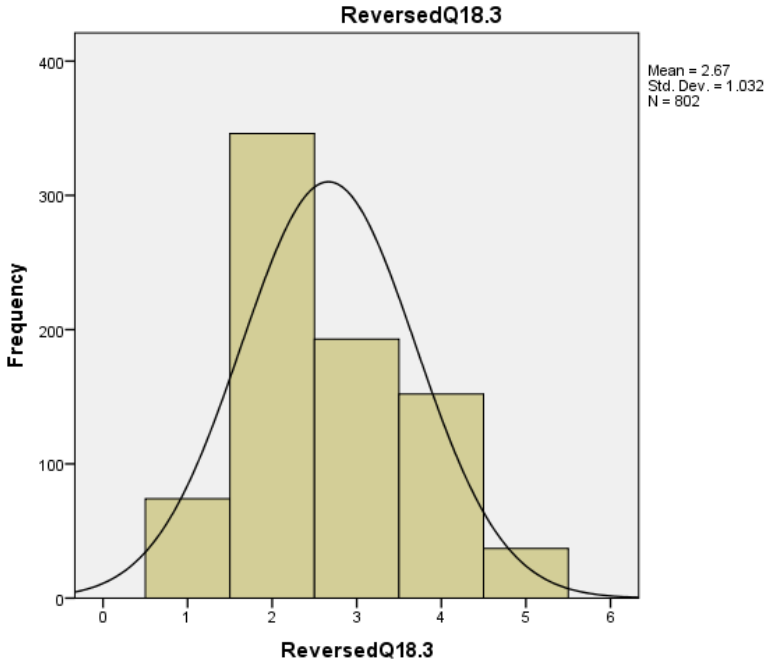

Through relatives in another city
Mean = .07
Std. Dev. = .257
N = 802
Frequency
1,200
1,000
800
600
400
200
0
-.5
.0
.5
1.0
1.5
Through relatives in another city

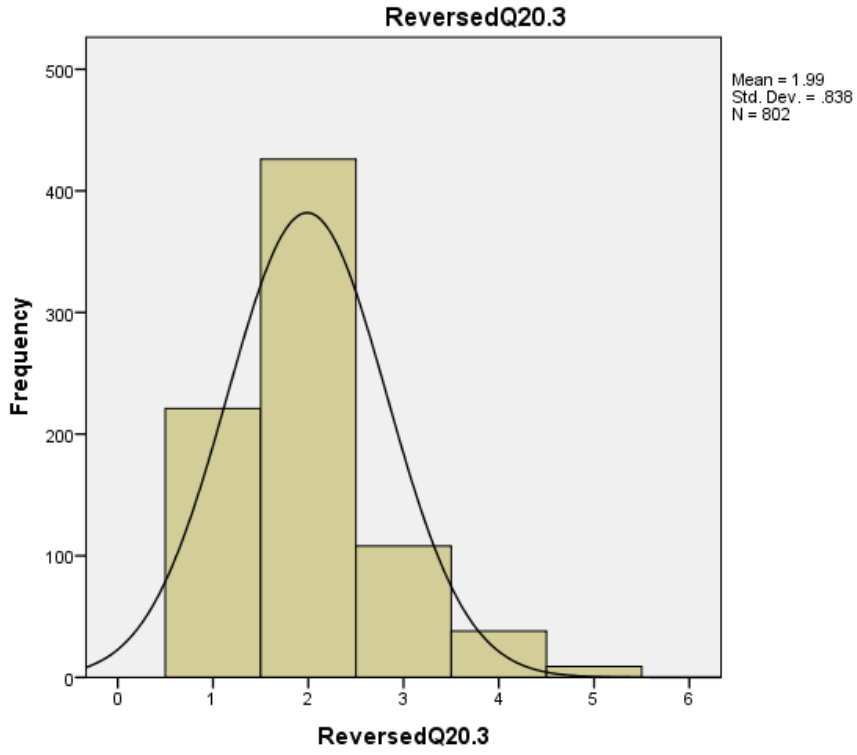

Through one of my family members
Mean = .16
Std. Dev. = .365
N = 802
Frequency
1,000
800
600
400
200
0
-.5
.0
.5
1.0
1.5
Through one of my family members

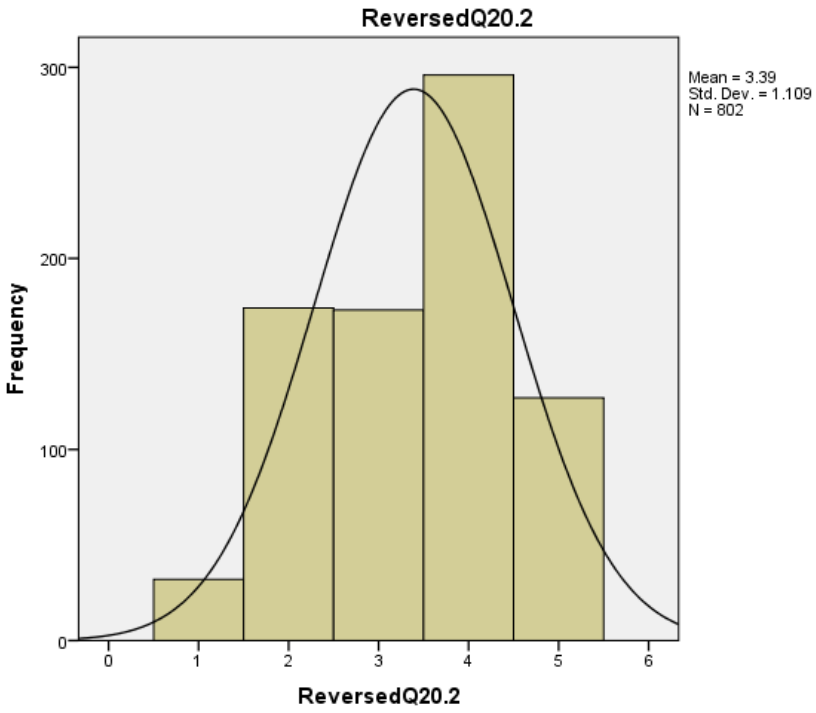

I did not apply for e-passport yet
Mean = 0
Std. Dev. = 0
N = 802
Frequency
1,000
800
600
400
200
0
-.50
-.25
.00
.25
.50
I did not apply for e-passport yet

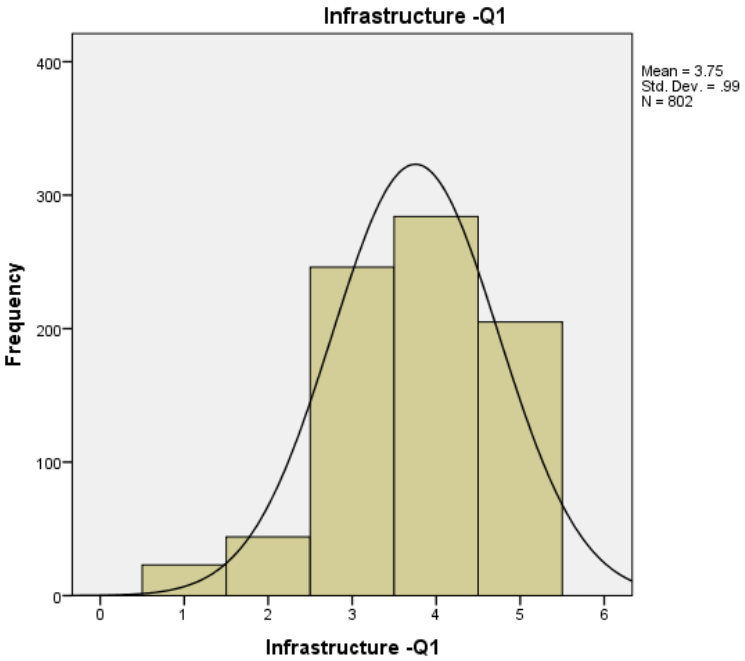

Reversed Questions 5-1
Mean = 3.08
Std. Dev. = 1.349
N = 802
Frequency
250
200
150
100
50
0
0
1
2
3
4
5
6
Reversed Questions 5-1

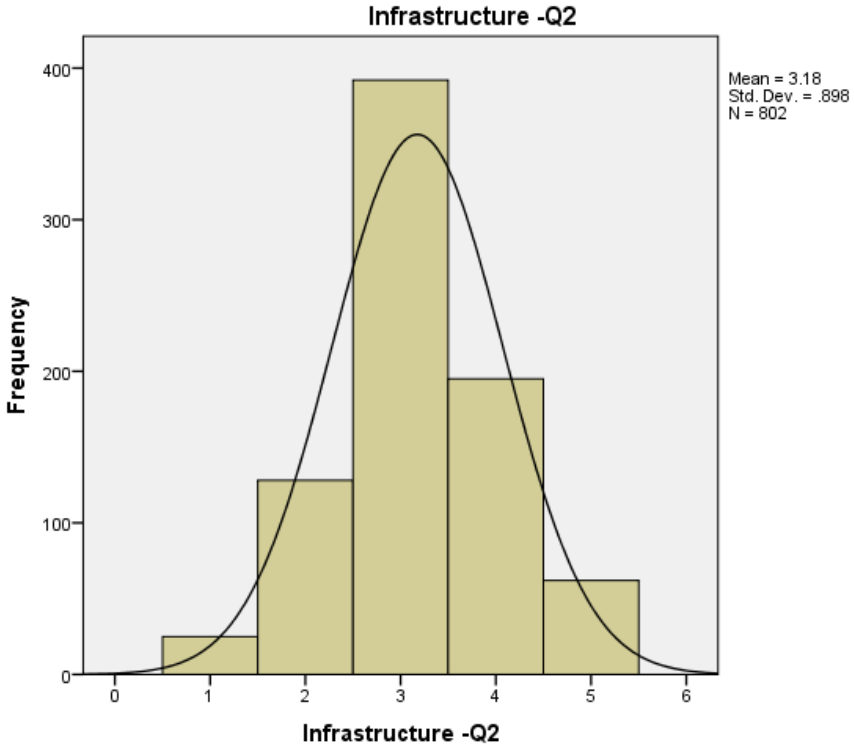

ReversedQ16.2
Mean = 2.05
Std. Dev. = .968
N = 802
Frequency
400
300
200
100
0
0
1
2
3
4
5
6
ReversedQ16.2

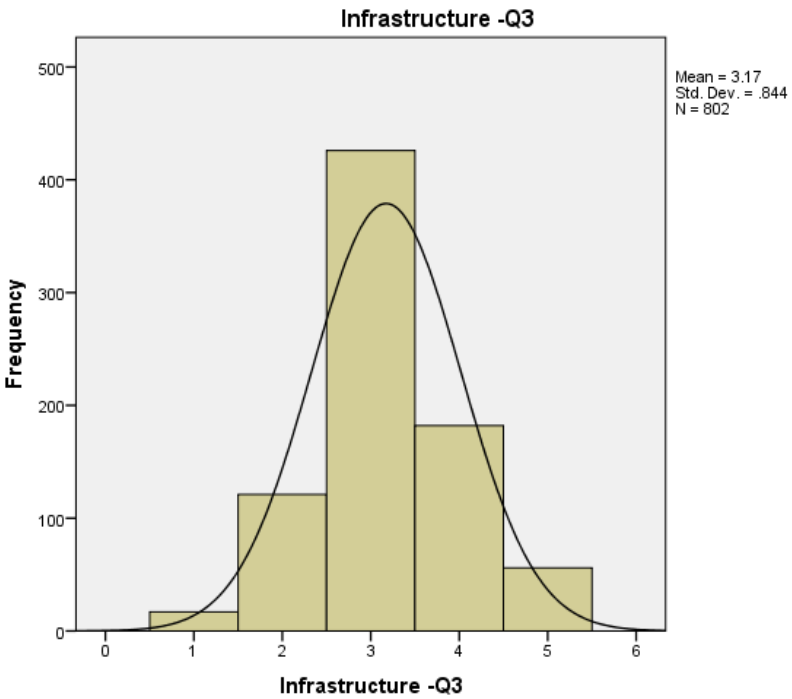

ReversedQ18.3
Mean = 2.67
Std. Dev. = 1.032
N = 802
Frequency
400
300
200
100
0
0
1
2
3
4
5
6
ReversedQ18.3

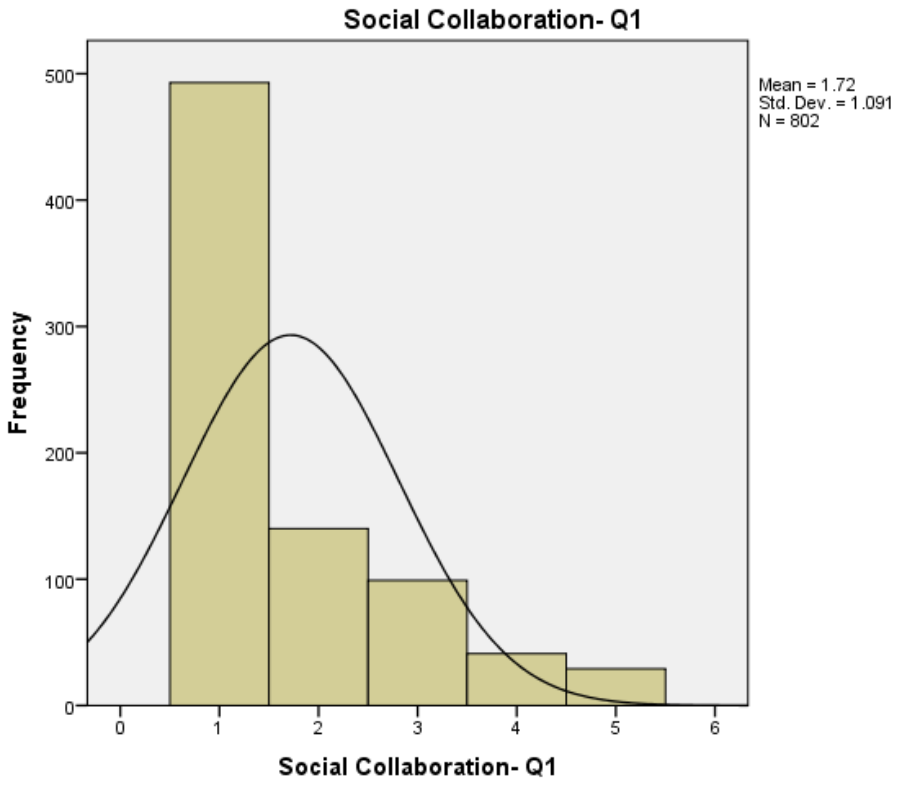

ReversedQ20.3
Mean = 1.99
Std. Dev. = .838
N = 802
Frequency
500
400
300
200
100
0
0
1
2
3
4
5
6
ReversedQ20.3

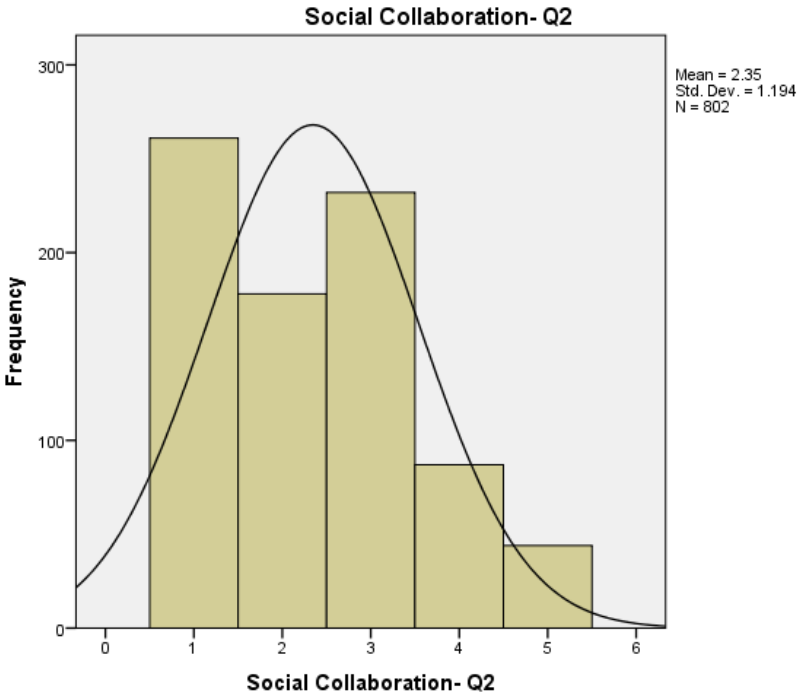

ReversedQ20.2
Mean = 3.39
Std. Dev. = 1.109
N = 802
Frequency
300
200
100
0
0
1
2
3
4
5
6
ReversedQ20.2

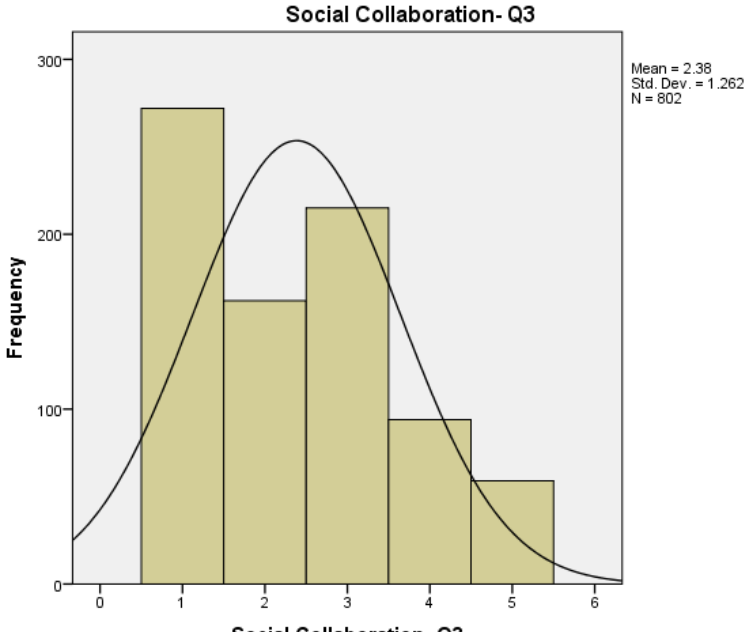

Infrastructure -Q1
Mean = 3.75
Std. Dev. = .99
N = 802
Frequency
400
300
200
100
0
0
1
2
3
4
5
6
Infrastructure -Q1

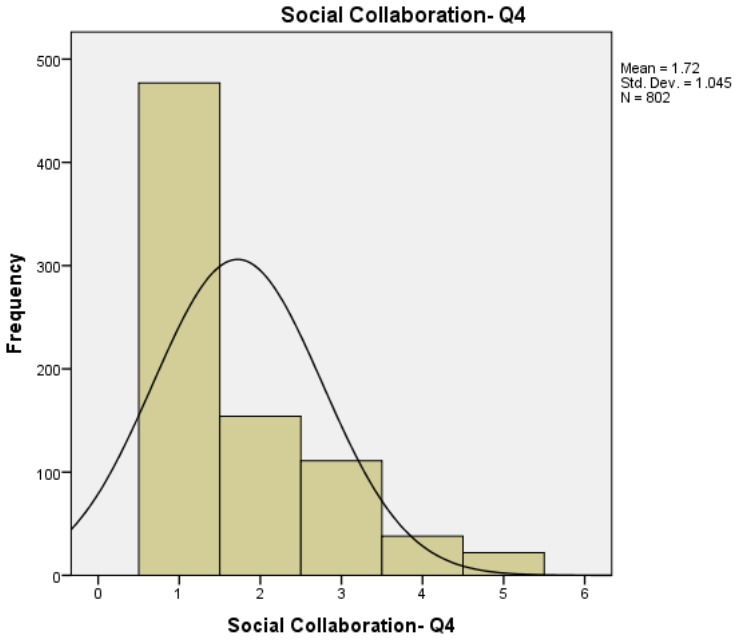

Infrastructure -Q2
Mean = 3.18
Std. Dev. = .898
N = 802
Frequency
400
300
200
100
0
0
1
2
3
4
5
6
Infrastructure -Q2

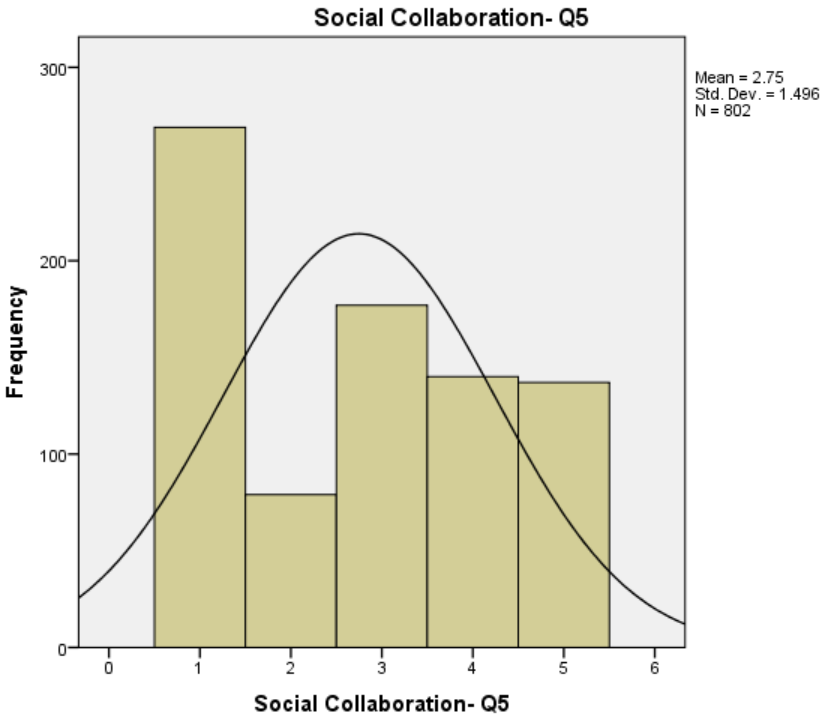

Infrastructure -Q3
Mean = 3.17
Std. Dev. = .844
N = 802
Frequency
500
400
300
200
100
0
0
1
2
3
4
5
6
Infrastructure -Q3

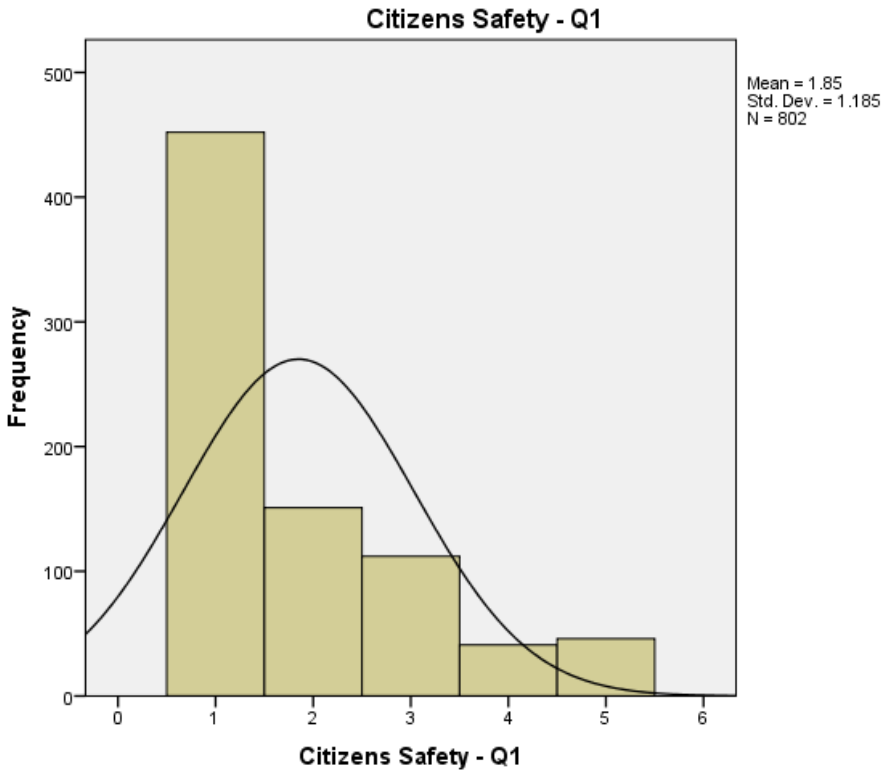

Social Collaboration- Q1
Mean = 1.72
Std. Dev. = 1.091
N = 802
Frequency
500
400
300
200
100
0
0
1
2
3
4
5
6
Social Collaboration- Q1


Social Collaboration- Q2
Mean = 2.35
Std. Dev. = 1.194
N = 802
Frequency
300
200
100
0
0
1
2
3
4
5
6
Social Collaboration- Q2

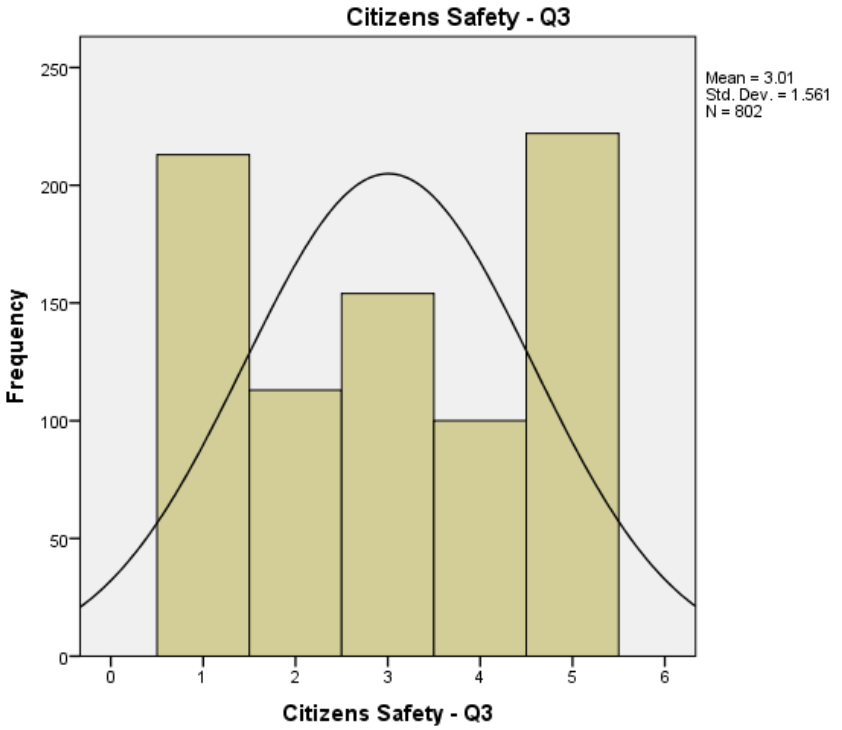

Social Collaboration- Q3
Mean = 2.38
Std. Dev. = 1.262
N = 802
Frequency
300
200
100
0
0
1
2
3
4
5
6

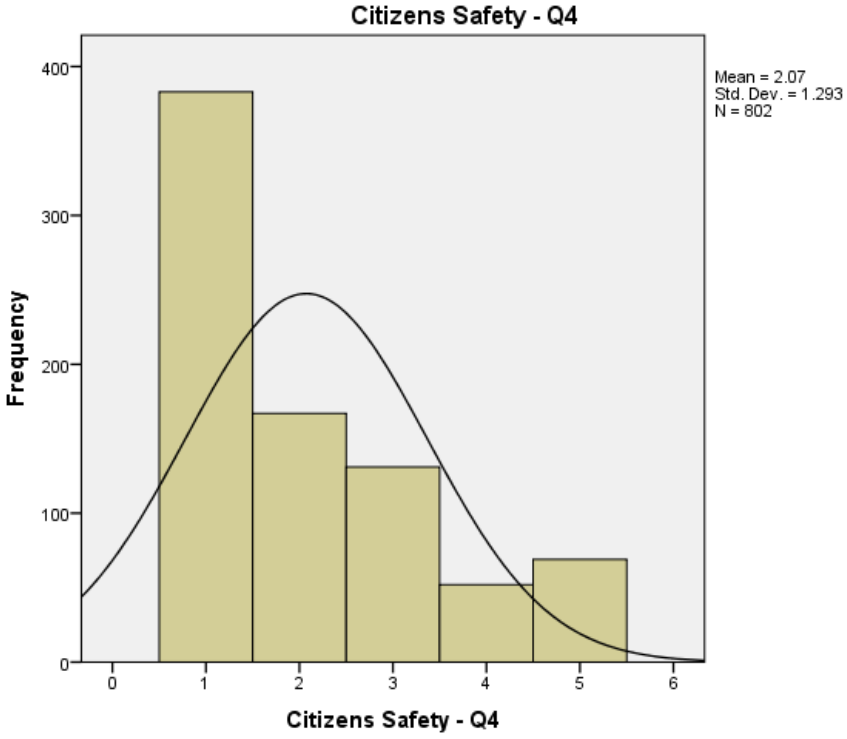

Social Collaboration- Q4
Mean = 1.72
Std. Dev. = 1.045
N = 802
Frequency
500
400
300
200
100
0
0
1
2
3
4
5
6
Social Collaboration- Q4

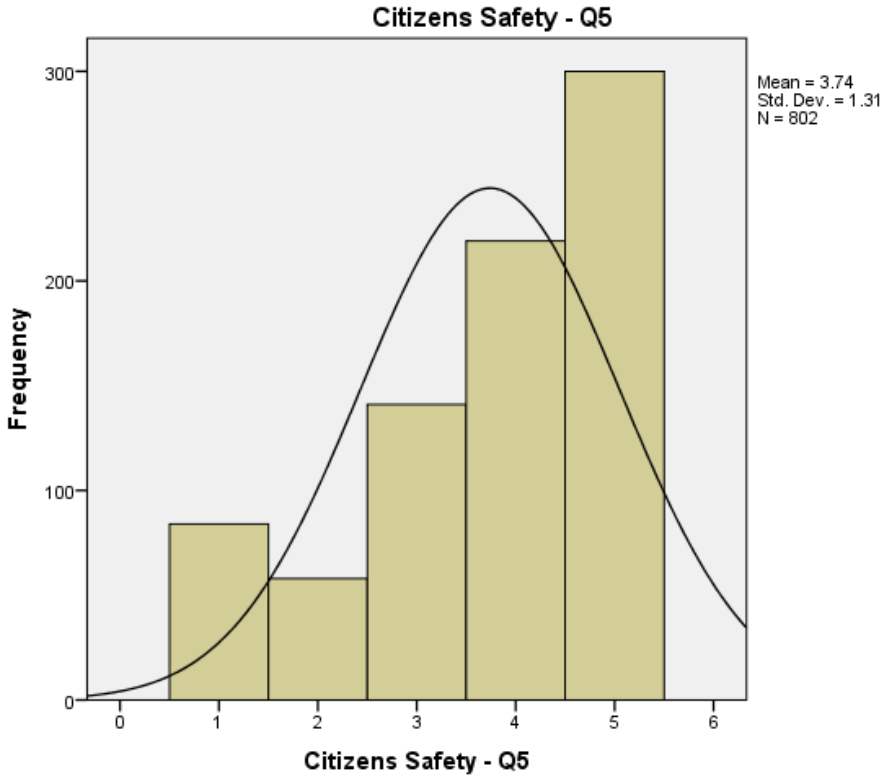

Social Collaboration- Q5
Mean = 2.75
Std. Dev. = 1.496
N = 802
Frequency
300
200
100
0
0
1
2
3
4
5
6
Social Collaboration- Q5


Citizens Safety - Q1
Mean = 1.85
Std. Dev. = 1.185
N = 802
Frequency
500
400
300
200
100
0
0
1
2
3
4
5
6
Citizens Safety - Q1

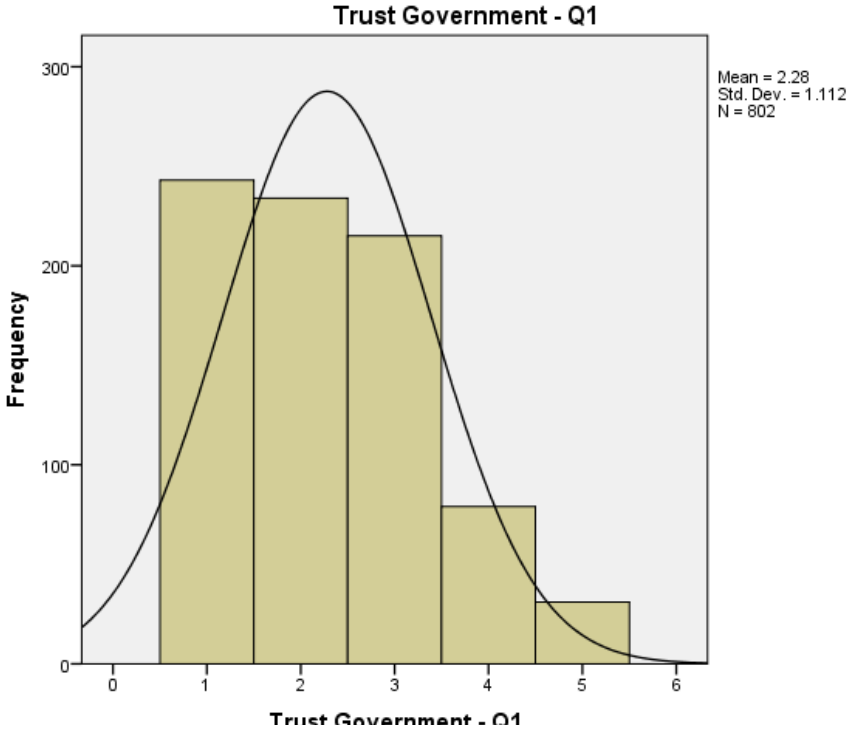

Citizens Safety - Q2
Mean = 2.67
Std. Dev. = 1.409
N = 802
Frequency
250
200
150
100
50
0
0
1
2
3
4
5
6
Citizens Safety - Q2

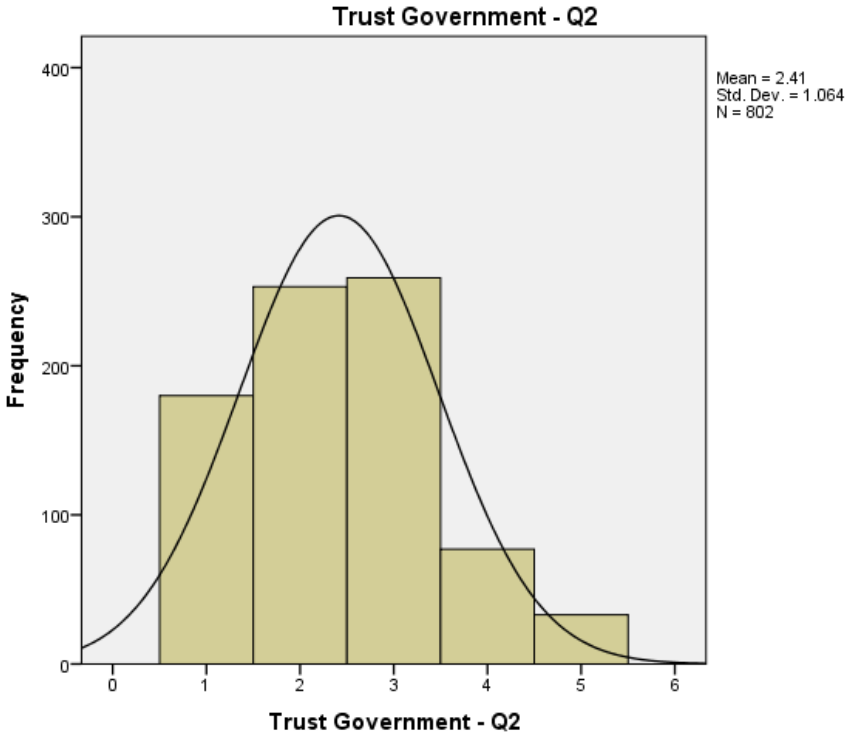

Citizens Safety - Q3
Mean = 3.01
Std. Dev. = 1.561
N = 802
Frequency
250
200
150
100
50
0
0
1
2
3
4
5
6
Citizens Safety - Q3

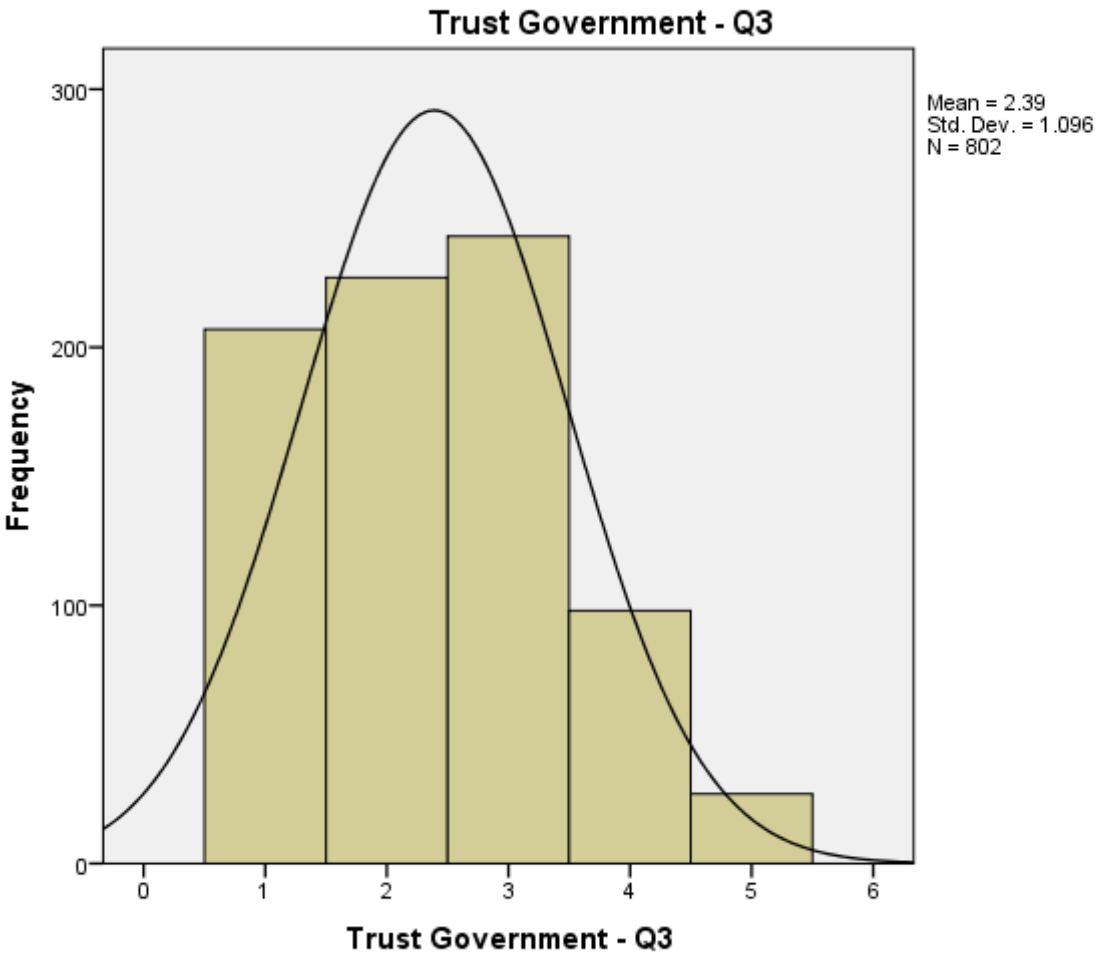

Citizens Safety - Q4
Mean = 2.07
Std. Dev. = 1.293
N = 802
Frequency
400
300
200
100
0
0
1
2
3
4
5
6
Citizens Safety - Q4

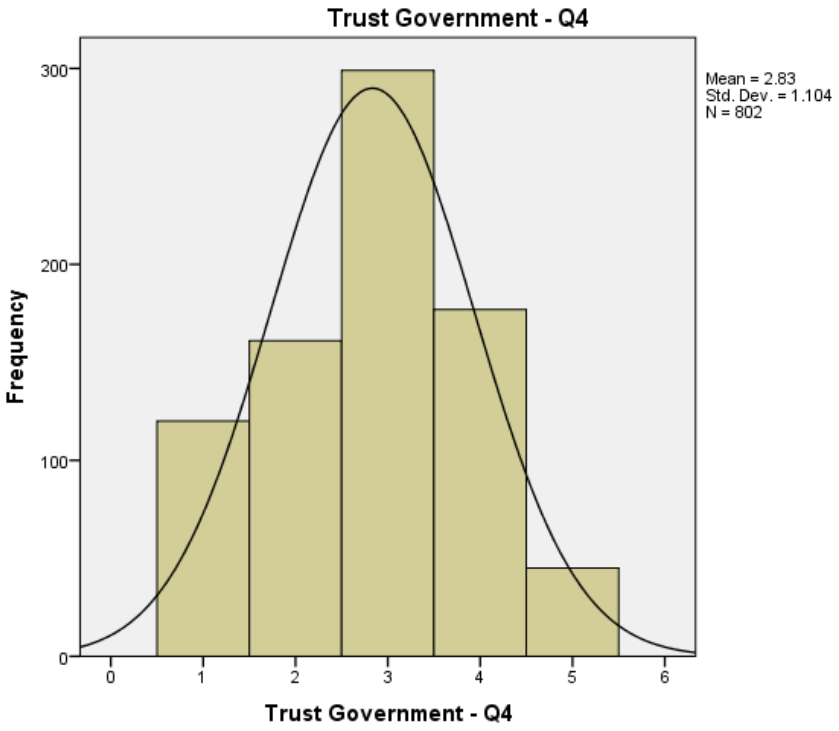

Citizens Safety - Q5
Mean = 3.74
Std. Dev. = 1.31
N = 802
Frequency
300
200
100
0
0
1
2
3
4
5
6
Citizens Safety - Q5

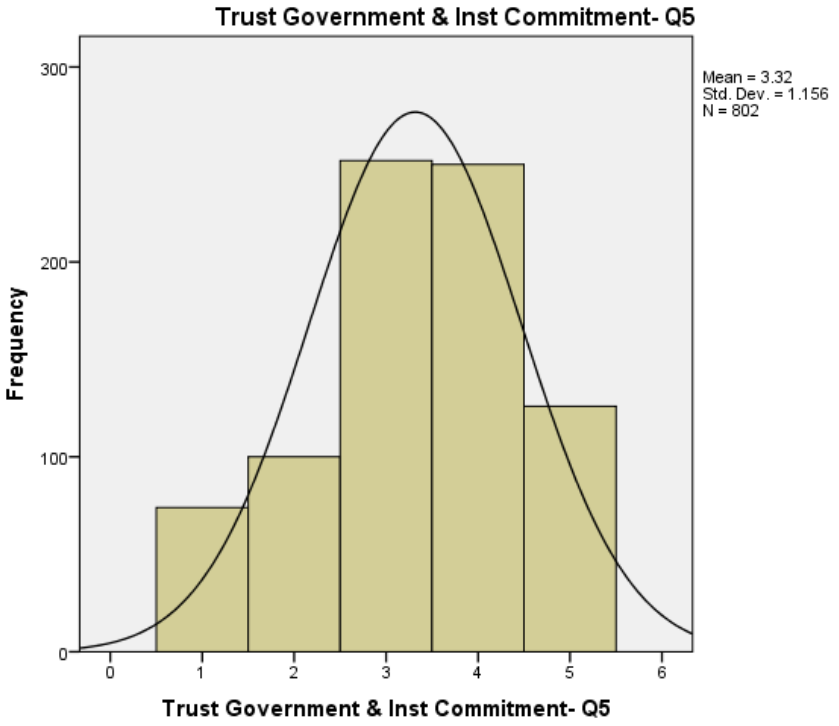

Citizens Safety - Q6
Mean = 3.08
Std. Dev. = 1.349
N = 802
Frequency
250
200
150
100
50
0
0
1
2
3
4
5
6
Citizens Safety - Q6

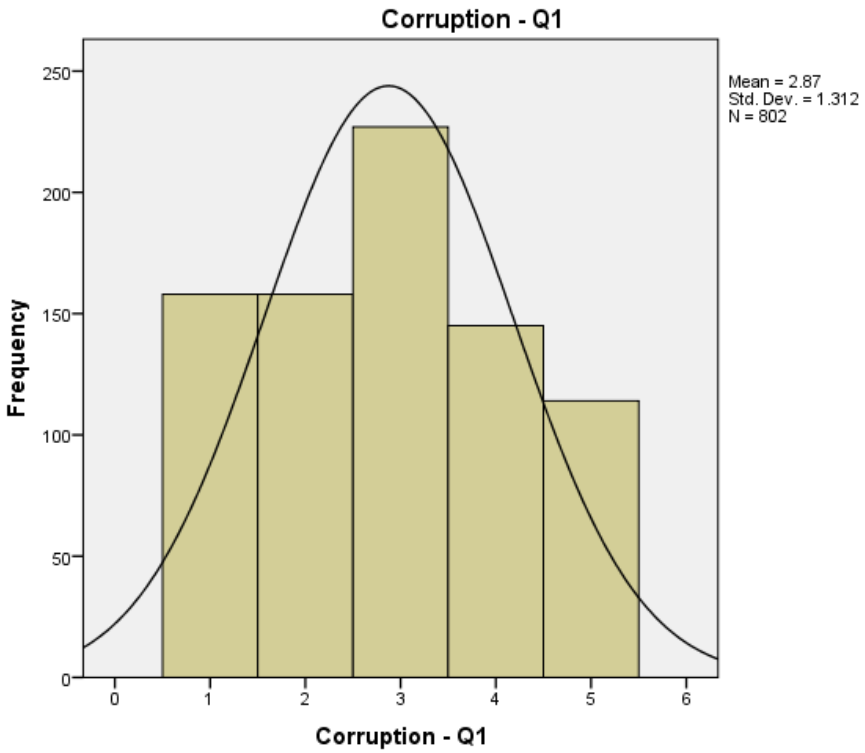

Trust Government - Q1
Mean = 2.28
Std. Dev. = 1.112
N = 802
Frequency
300
200
100
0
0
1
2
3
4
5
6
Trust Government - Q1

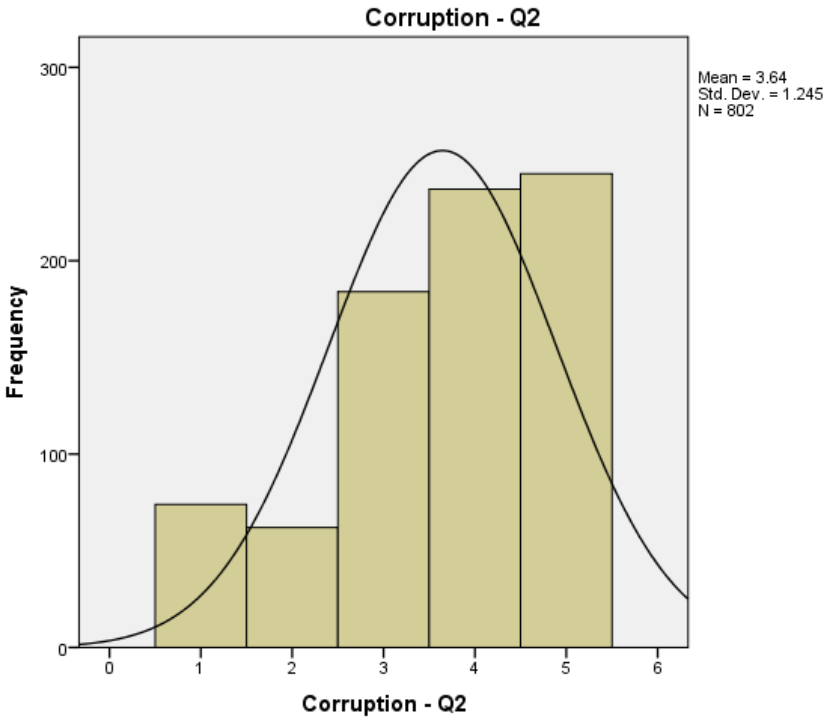

Trust Government - Q2
Mean = 2.41
Std. Dev. = 1.064
N = 802
Frequency
400
300
200
100
0
0
1
2
3
4
5
6
Trust Government - Q2

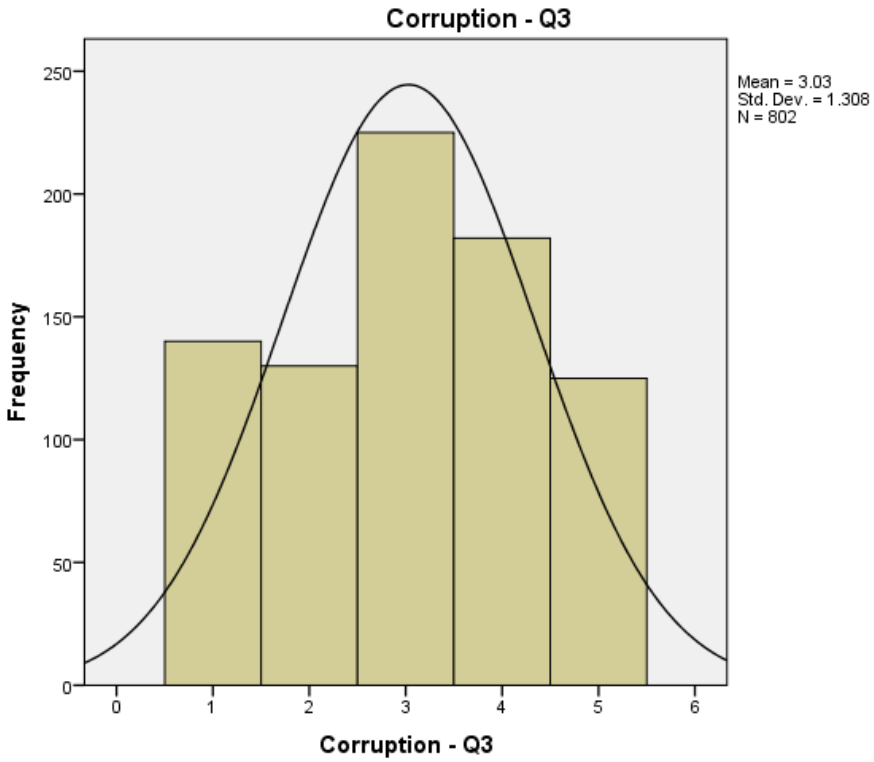

Trust Government - Q3
Mean = 2.39
Std. Dev. = 1.096
N = 802
Frequency
300
200
100
0
0
1
2
3
4
5
6
Trust Government - Q3

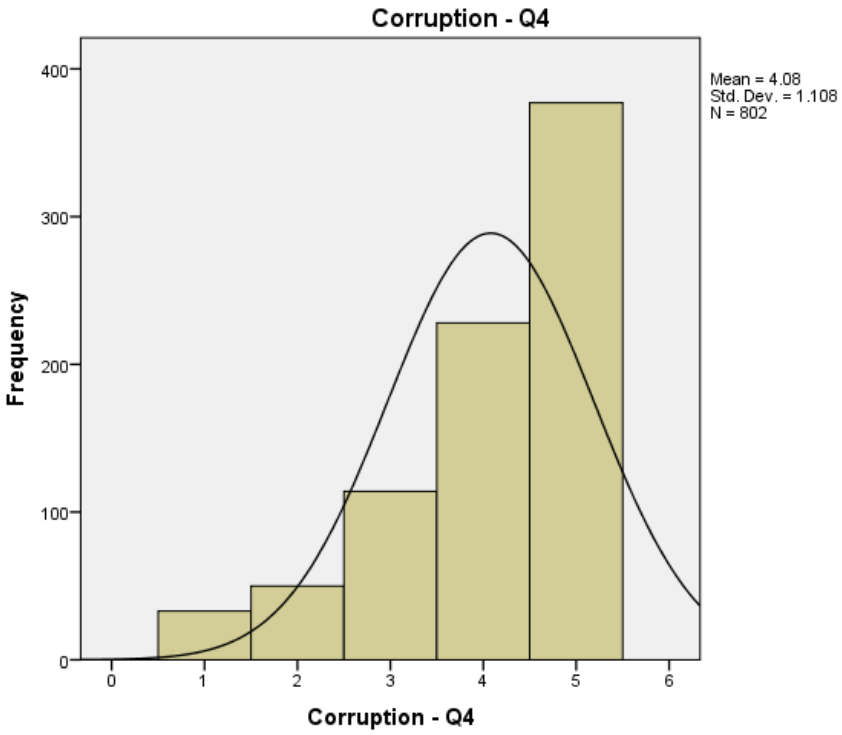

Trust Government - Q4
Mean = 2.83
Std. Dev. = 1.104
N = 802
Frequency
300
200
100
0
0
1
2
3
4
5
6
Trust Government - Q4

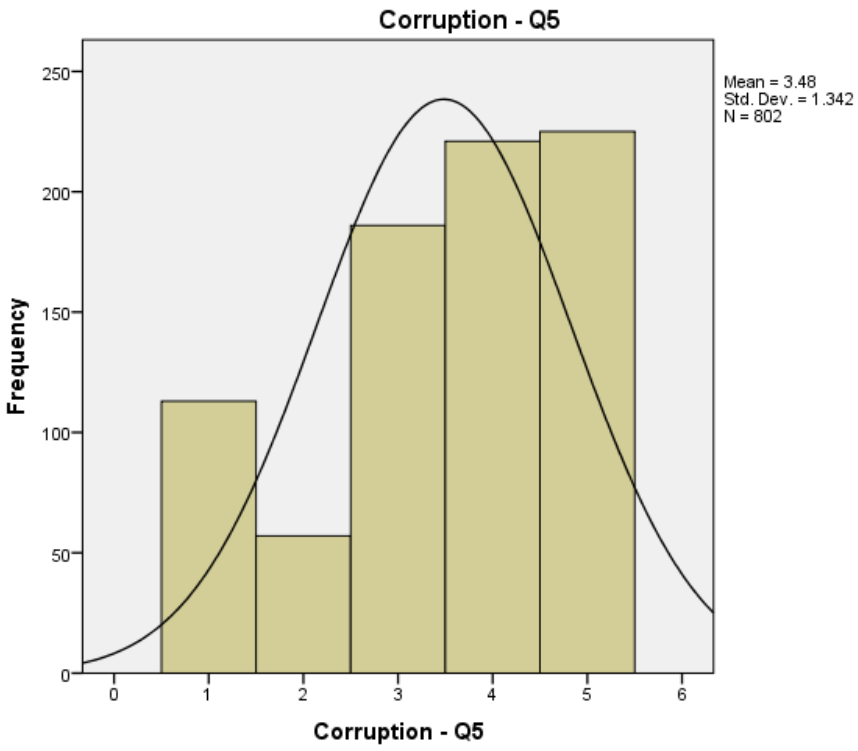

Trust Government & Inst Commitment- Q5
Mean = 3.32
Std. Dev. = 1.156
N = 802
Frequency
300
200
100
0
0
1
2
3
4
5
6
Trust Government & Inst Commitment- Q5

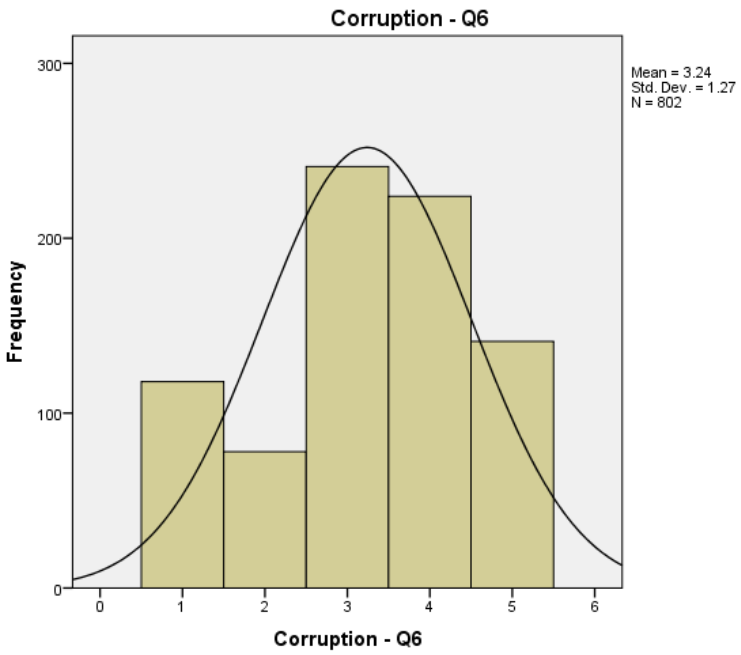

Corruption - Q1
Mean = 2.87
Std. Dev. = 1.312
N = 802
Frequency
250
200
150
100
50
0
0
1
2
3
4
5
6
Corruption - Q1


Corruption - Q2
Mean = 3.64
Std. Dev. = 1.245
N = 802
Frequency
300
200
100
0
0
1
2
3
4
5
6
Corruption - Q2


Corruption - Q3
Mean = 3.03
Std. Dev. = 1.308
N = 802
Frequency
250
200
150
100
50
0
0
1
2
3
4
5
6
Corruption - Q3


Corruption - Q4
Mean = 4.08
Std. Dev. = 1.108
N = 802
Frequency
400
300
200
100
0
0
1
2
3
4
5
6
Corruption - Q4


Corruption - Q5
Mean = 3.48
Std. Dev. = 1.342
N = 802
Frequency
250
200
150
100
50
0
0
1
2
3
4
5
6
Corruption - Q5


Corruption - Q6
Mean = 3.24
Std. Dev. = 1.27
N = 802
Frequency
300
200
100
0
0
1
2
3
4
5
6
Corruption - Q6